THE JOURNAL OF GAS LIGHTING
WATER SUPPLY & SANITARY IMPROVEMENT

VOL. LXXXII. No. 2090.] LONDON, JUNE 2, 1903. [55TH YEAR. PRICE 6d.

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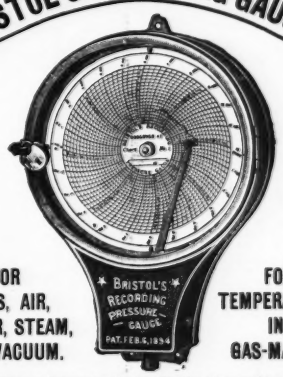

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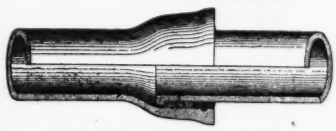

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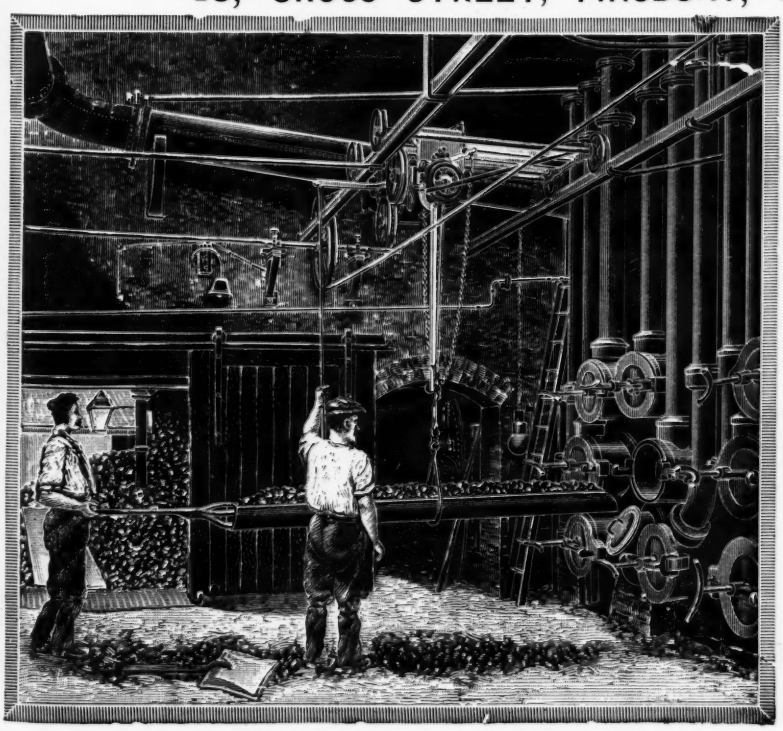

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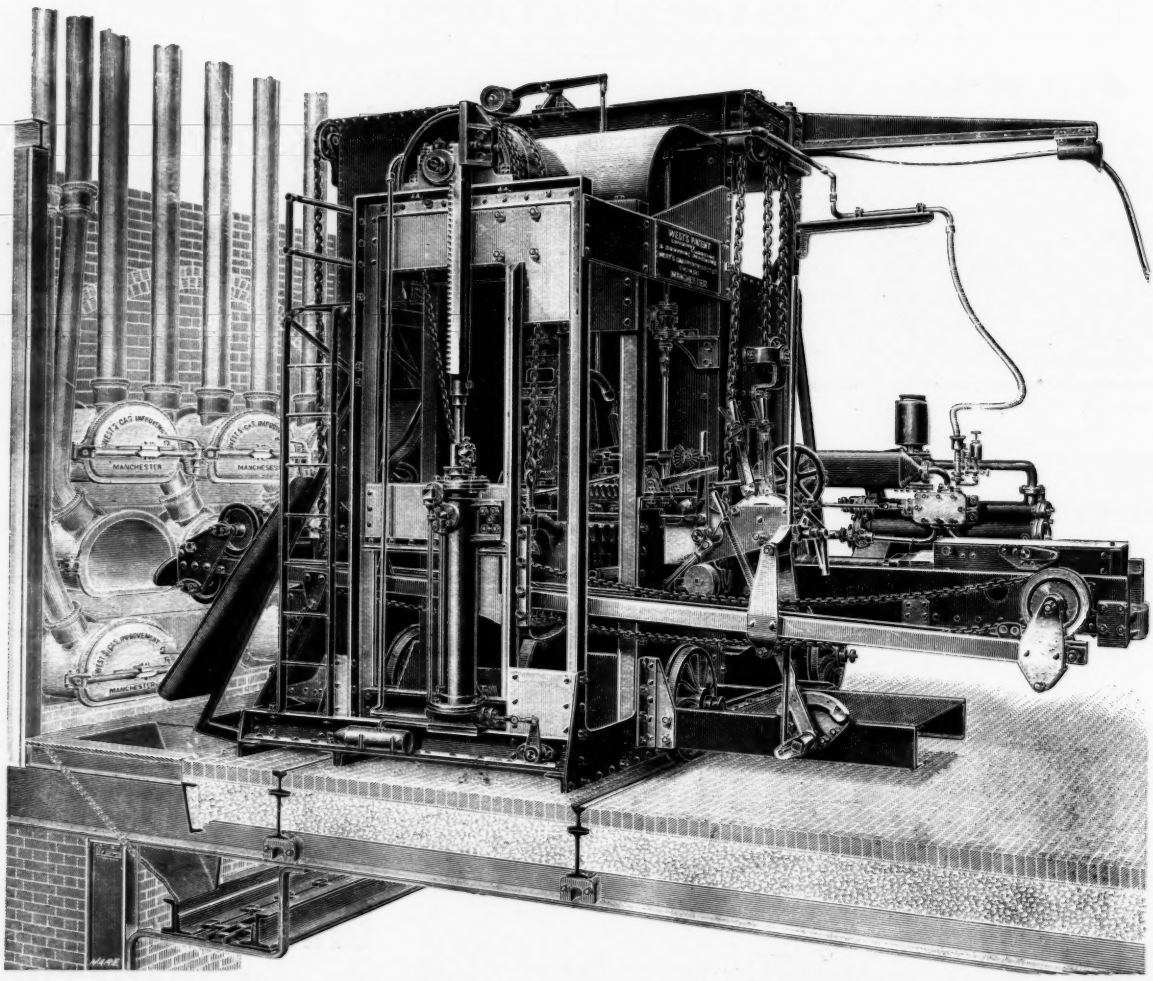

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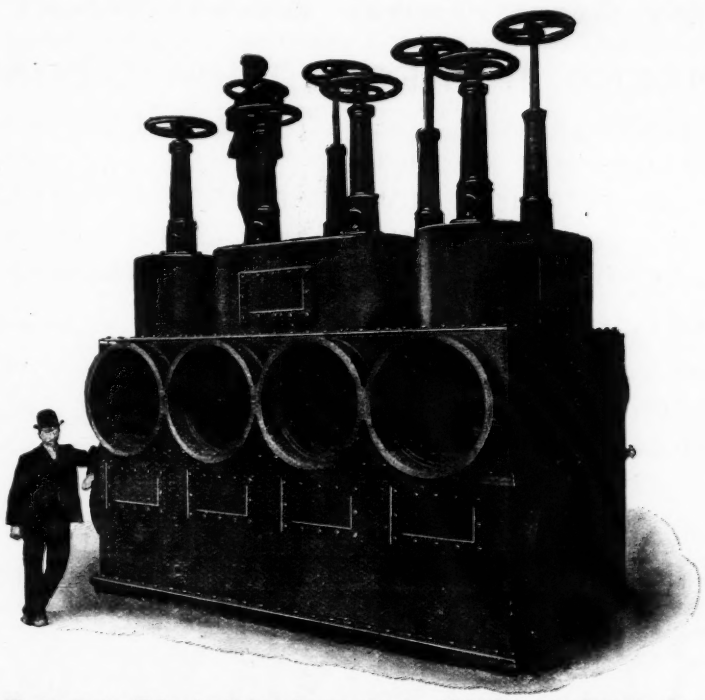

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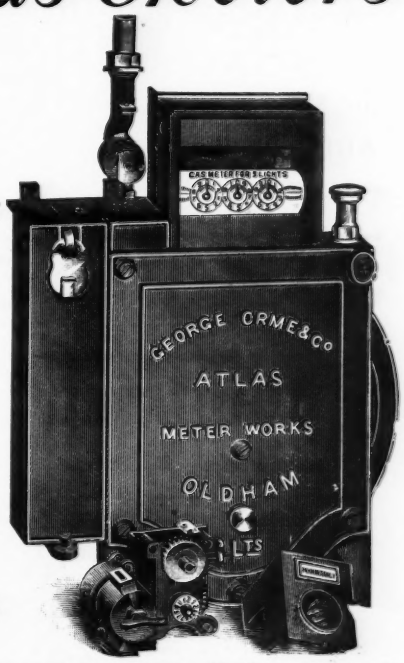

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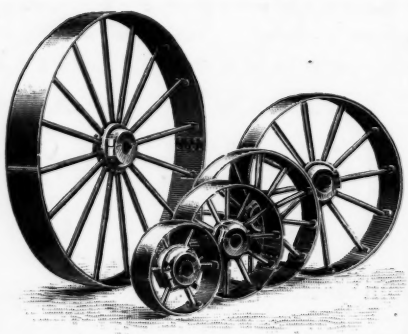

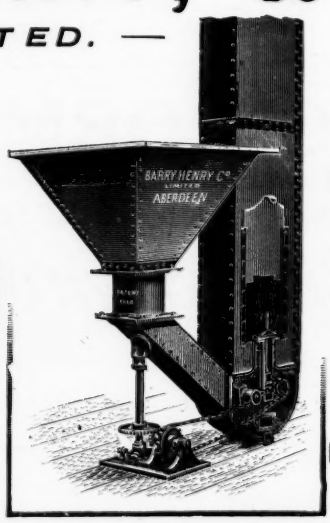

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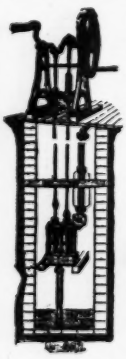

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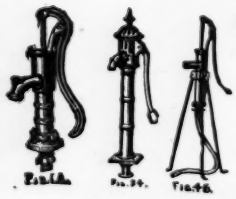

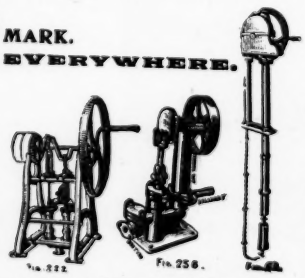

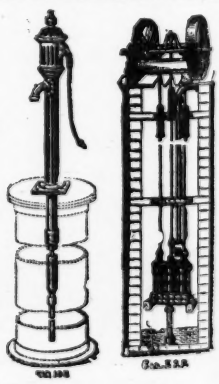

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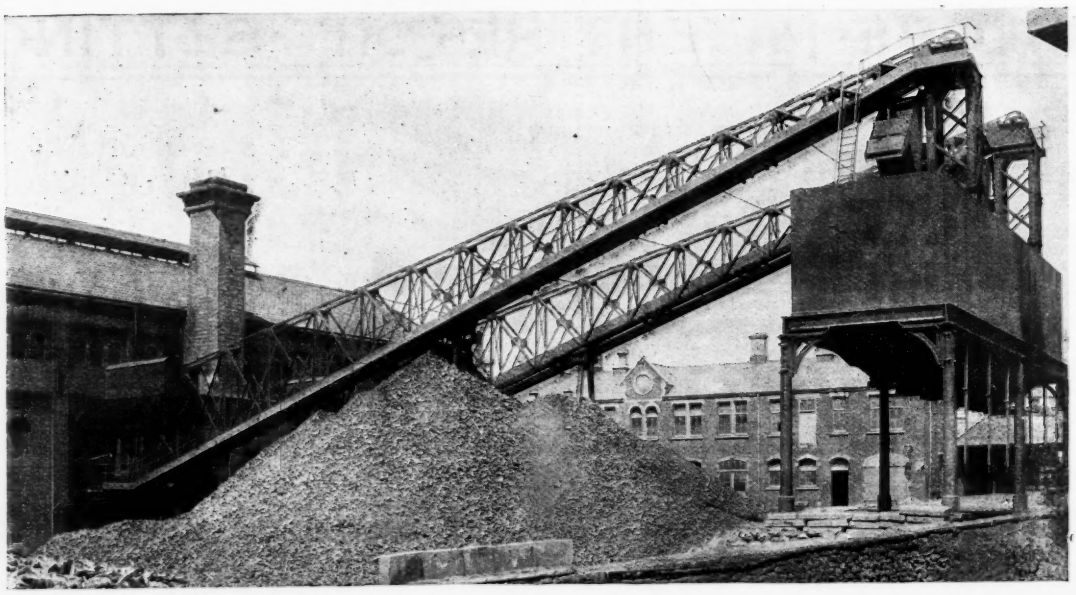

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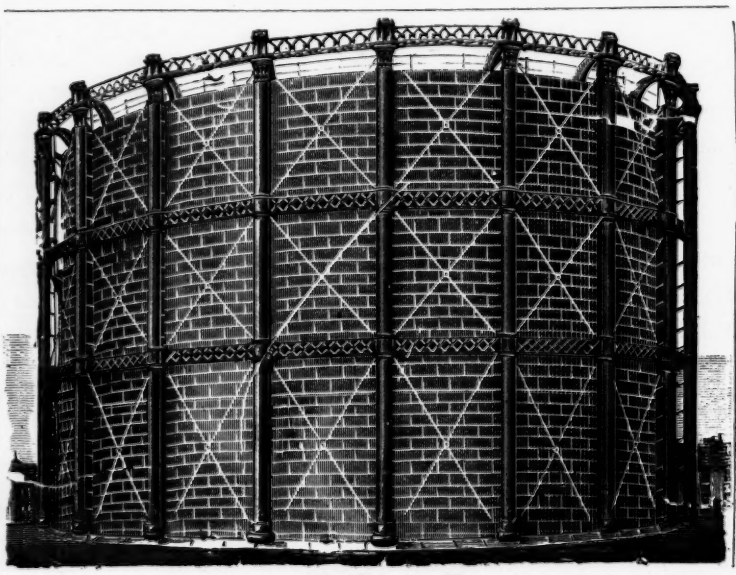

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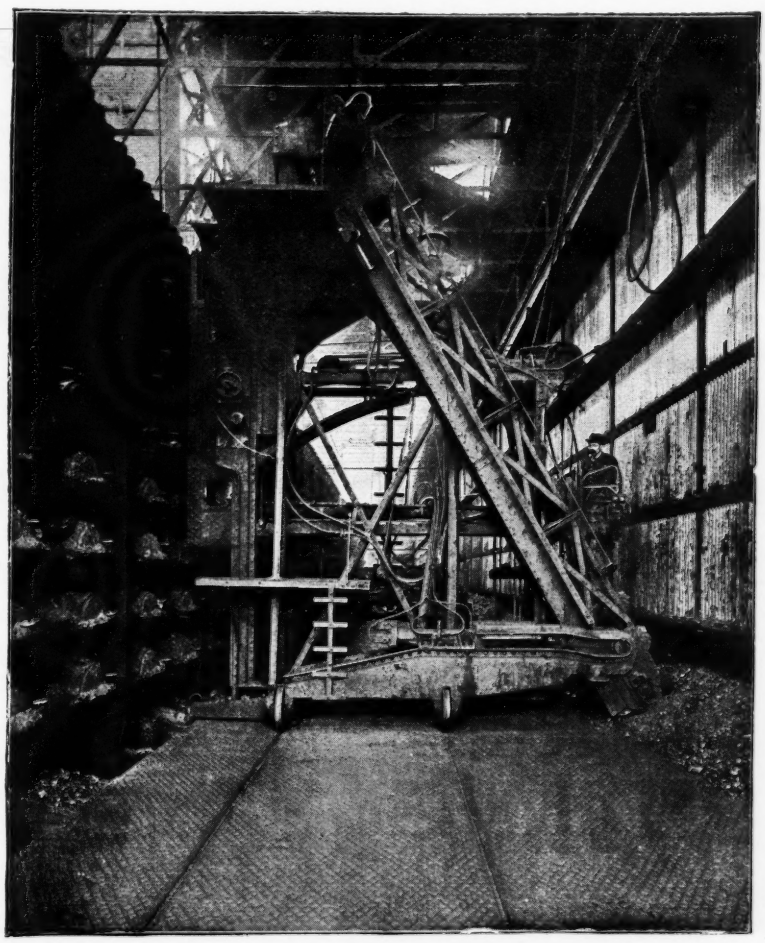

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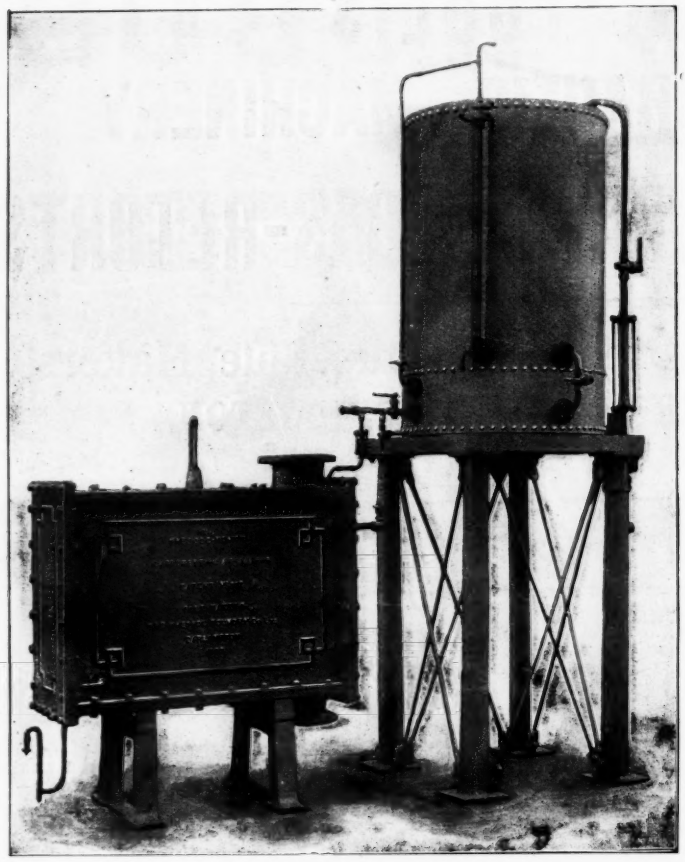

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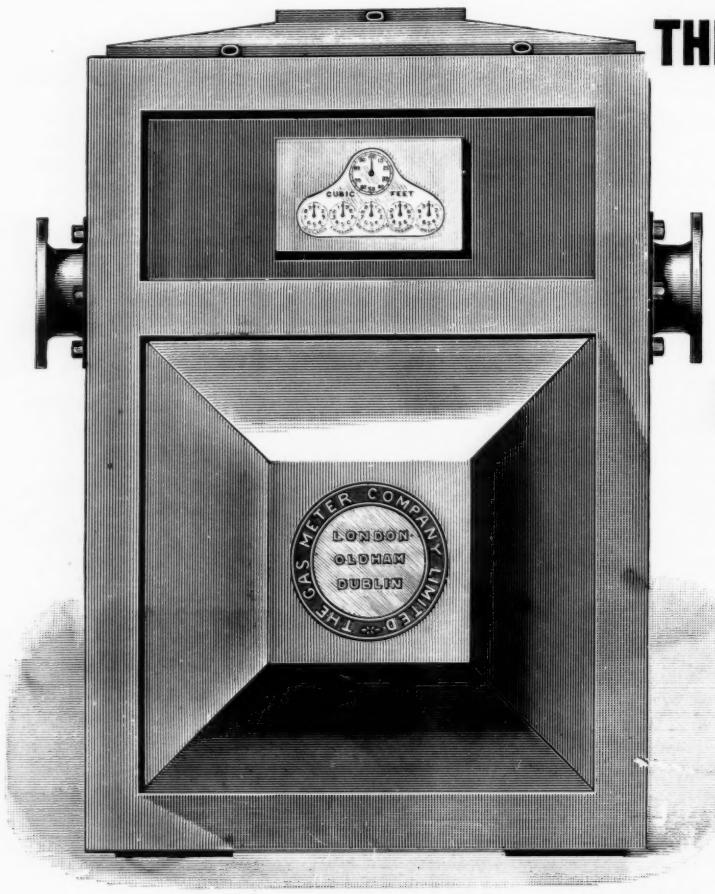

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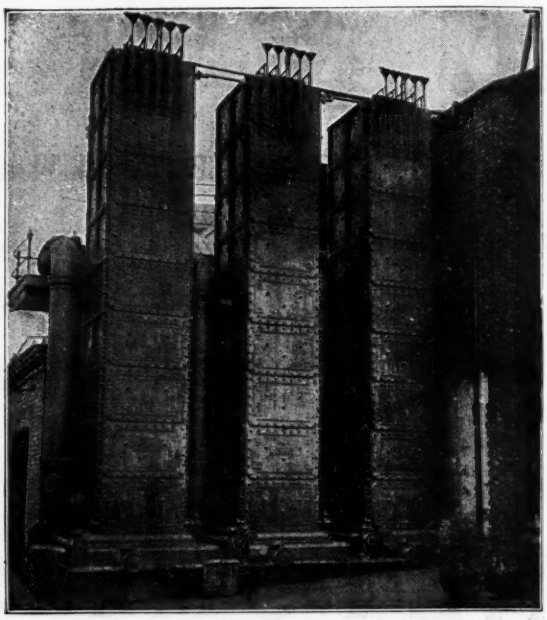

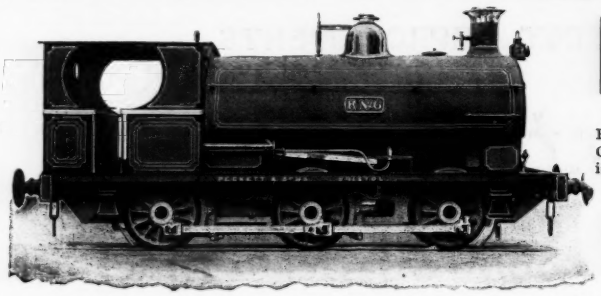

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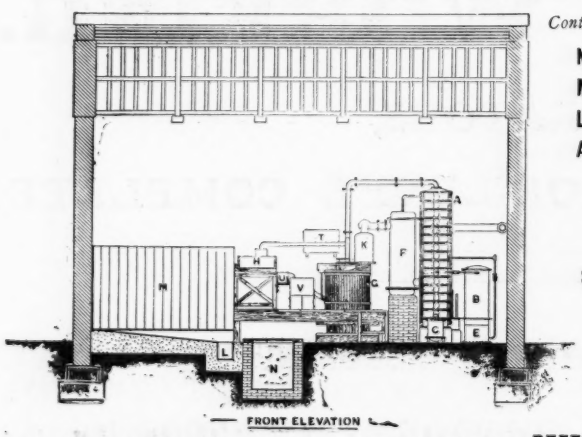
SIMPLE CONSTRUCTION. EASY MANAGEMENT. HIGHEST EFFICIENCY.



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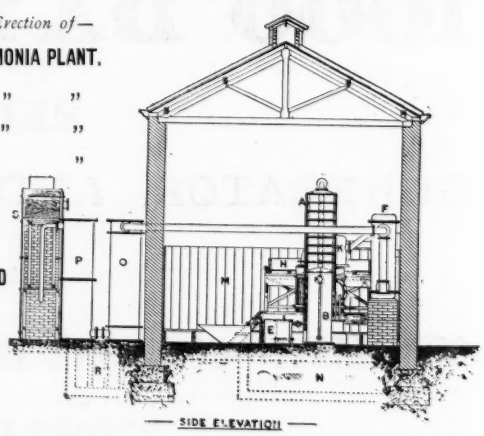

SIDE ELEVATION

REFERENCES.

A. Large Still (Ammonia).
B. Small Still (Lime).
C. Spent Liquor Valve.
E. Limeing Arrangement.
F. Heater.
G. Saturator.
H. Draining Table.
K. Lead Catch Box.
L. Mother Liquor Well.
M. Sulphate Store.
N. Acid Store Tank.
O. Condenser.
P. Scrubber.
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T. Acid Supply Tank.
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V. Mother Liquor Receiver.

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Wilton's Patent Neutralizing Apparatus for the Waste Gases from Sulphate of Ammonia Plant.

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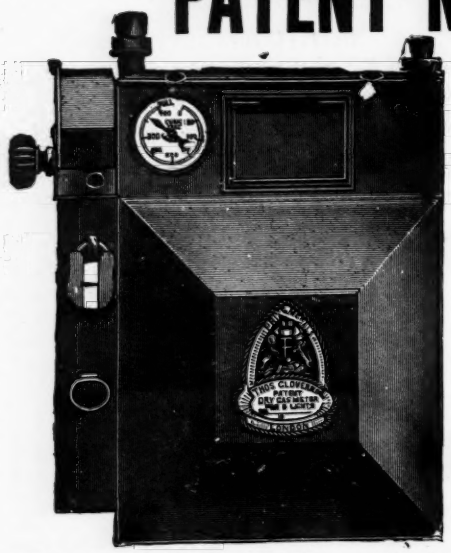

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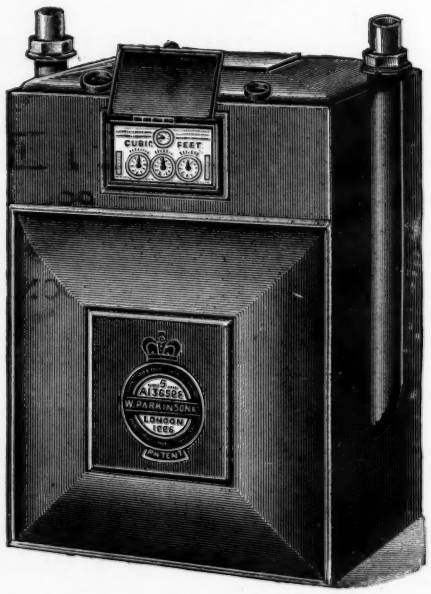

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EDITOR & PUBLISHER: WALTER KING. OFFICE: 11, BOLT COURT, FLEET ST., LONDON.

VOL. LXXXII., No. 2090.—TUESDAY, JUNE 2, 1903.

EDITORIAL NOTES.

A New Imperial Fiscal System.

THOUGH the subject is not as yet cast into any definite shape, and therefore no more concerns the gas industry of the United Kingdom than any other national interest, it would not be right to let this week pass without recording what will probably prove to be the historically memorable declarations regarding the fiscal policy of the country, with which the Prime Minister and the Colonial Secretary dismissed the House of Commons for the recess. It has transpired, from the highest quarters, that the main question to be put to the country at the next General Election will be that of the advisability of altering or maintaining the national system of taxation, probably including local rating, which has been in force, the one since the days of Sir Robert Peel, the other since the time of Queen Elizabeth. It would be an insult to the intelligence of our readers to explain the high importance of this news. Whatever a citizen's calling, he is a taxable and rateable unit in some way or another; and the great national industry of gas manufacture contributes too much to the revenue of the State and to local revenues not to be deeply concerned in any proposals for altering the bases on which the fiscal system of the country is reared.

Nobody can feel genuinely surprised that the question shou'd have been raised just now. Every payer of income-tax, at any rate, must have felt during the last few years that the sources of revenue for Imperial purposes, at least, were overstrained. If this feeling could be put into words, it would run to the effect that the bases of taxation should be widened. Most people who thought about the matter at all were persuaded that, somehow, the undeniable margin of benefit which the cheapening of most consumables in general demand has brought to the consumer through no effort of his own—the marketer's "unearned increment," in brief—ought to be laid under contribution to eke out the product of direct taxation. Taking it "by and large," the purchasing power of the sovereign at home is greater than anywhere else in the world; and the general level of well-being of the population is higher. Wages have risen by about 25 per cent. within the last thirty years; and the prices of most articles of consumption have fallen by as much. On the other hand, employers of labour, and especially owners of agricultural land and their immediate dependents, have not fared so well. The dividends on the best securities have diminished; and shopkeepers complain that it is only possible to earn anything like their old profits by doing a greatly increased volume of business.

It appears from this most cursory of views that the wage-earners of the country have benefited most by the movement in values. The question that arises upon this is whether they should contribute a little more, or as much as may be required, towards the cost of running the Empire in which their part is so conspicuous. This means taxing the people's food—which is *anathema* to the living relics of the Anti-Corn Law League. But why should not food be taxed? The consumer of all kinds of food and drink to-day is much better off than were the starvelings of 1846. The idea once was that luxuries might be taxed, not necessaries of life. But it would be difficult to draw the line between what the prosperous workman of 1903 would classify as his luxuries and his necessaries. The luxuries of one age are the indispensables of the next. Is tea any longer of this class? To what category should imported meat-extracts be relegated? Beer, under a certain strength, is no more a luxury than the bread and cheese which naturally go with it. So far as command of enough good food goes, there is no difference between an unskilled labourer and a so-called rich man. The spokesmen for the Government have made it quite clear that the raw materials of manufacture are not to be taxed, which is an immense satisfaction. As to the rest, however, those who live until the next General Election will see. A most valuable object-lesson has been obtained both by the putting on and the taking off of the corn duty, which will not be lost at the proper time. One would probably be not far wrong in prophesying that the next corn duty will be a more substantial one, and that it will be paid just for the same reason that the French citizen pays his *octroi*—because it suits the taxpayer to do so rather than to contribute to the public exchequer in another way.

New Problems in Old Forms.

IT is a remarkable truth of human experience, that while the problems which engage men's attention from age to age differ as regards subject-matter, they repeat the same forms over and over again. Thus, to name a humorous example of the kind of thing we mean, it has never been quite satisfactorily settled which came first, the hen or the egg. And the longer we live, and the more complex our civilization becomes, the more frequently do we find our speculations running to the same hopeless dead-end of all argument. Learned men give a very awe-inspiring turn to the old problem, by declaring it to be a question of *post hoc* and *propter hoc*. Whenever two phenomena happen one after another, so as to suggest a sequence, in what relation do they stand to each other? Is one the cause and the other the effect; or, if not, why not? Tenterden Steeple may not have had any close connection with the appearance of the Goodwin Sands; but at least one would like to be assured of the fact. At the present moment, the question whether Free Trade is to be rightly esteemed the parent of British national prosperity, such as it is, or whether the two things are connected at all, is regarded as being open.

In the industrial domain, very much the same puzzle prevails in respect to the question of cheap power. Some maintain that the chief need of the working world is a cheap and abundant supply of mechanical power, whether this be provided by water, steam, or gas. Others object that, if this is so, the wonder is that industry should not have concentrated itself long ago in places where cheap power was always to be had. This immediately raises the question in the old form, of whether the work comes first or the means of doing the work. The truth of the matter is, that the world's need of work, and the world's provision of energy capable of doing it, have not borne any geographical relation to each other. Between the coal in the pit and the steamship at sea, there has been no particular link, save the commercial one. Similarly, the useful sources of power in Nature are usually in one place, and the needs which they might supply are found elsewhere. Facts are not materially changed in this regard by any change of the form of energy available. Niagara, a blast-furnace, or a coal-pit, as possible sources of power, are all alike. People are always talking about taking work to them; but they never do it to any great extent. The coal has to be sent to market; and so must the other kinds of potential energy, if they are to find a purchaser.

A striking illustration of this law is to be found in the industrial history of the natural gas of the United States. Some might think that where such a marvellous supply of gaseous fuel occurs, the use of gas-engines would surely be enormously developed. But the exact opposite is true. The largest gas-engines, and the most advantageous use of them, must be looked for in Germany, Belgium, and France, not in the land of natural gas. For some reason, the gas-engine, even in small sizes, has never been very popular in the United States, although the ordinary prices of illuminating gas certainly do not rule higher there than on the Continent, where gas-engines are in general use. Quite lately, America has plucked up courage to make some large gas-engines for pumping and compressing natural gas. It is reported that, although the old days of wasteful production and use of this unique natural product are past or passing, there is hope that a supply will be available, by pumping, for an indefinite period. Waste of all kinds, including that of distribution to excessive distances, is being checked. It is considered that, in the near future, all natural gas will be used within from

10 to 20 miles of the wells. This is a gas, it should be remembered, which has a calorific power of from 1000 to 1100 British thermal units per cubic foot, without any sulphur or incombustible constituent. It gives a brake horse power, in a compressing engine, for a consumption of from 7½ to 9 cubic feet per hour. Yet it is only now, and slowly, that power users are reported to be concentrating round the wells, instead of requiring the gas to be conveyed to them; although there is no such cheap and convenient source of energy anywhere besides.

The world is waiting with exemplary patience for the result of all the cheapened offers of gas and electric power of which one hears so much nowadays. Will the egg hatch out satisfactorily, or will the hen lay a sufficiency of golden eggs? For we are in the same old difficulty, of the impossibility of distinguishing cause from consequence. It is greatly to be desired that those who are running the experiments will keep them on long enough to show the proper effects. Power users are, of all traders, slow to change their methods. This is because the wheels must be kept going round, at whatever cost. Not for five years will the full effects of such a change as the Corporation of Manchester recently made in the prices of power be seen in the district; and not then, if there is the smallest risk of things going back to what they were before. We sympathize with Alderman Gibson in his declared difficulty in discriminating on principle in all cases between gas used for a trade purpose, and gas consumed for such a trade purpose as driving an engine. It is impossible to draw the line in this way. But there is no difficulty in pricing power gas at a cheap rate; and for some time at least it is to be hoped this practice of the Manchester Gas Committee, and others, will be adhered to. We wish to see what there is in it, and will wait patiently too, if it is understood that these reductions in the price of power gas in towns are intended to last. Other prices will have to be levelled down to them, and the sooner the better; but these must never be raised—unless, of course, gas and coal happen to become temporarily dear together.

Two Parliamentary Committees.

Before rising for their brief Whitsuntide recess, the House of Commons appointed a Committee to inquire into the actual state of industrial and trade combinations, under the law as defined by recent judgments of the Courts; and also nominated seven members of the House to join with an equal number of members of the House of Lords for the purpose of pursuing the inquiry into trading by British Municipalities. Both of these proceedings were very useful pieces of business, and may be expected to result in the collection of some valuable information. It may not be out of place to remark that the whole question of principle, as it lies before the former Committee, resolves itself into that of preferential dealing. It has been declared by the judgment in the *Mogul* steamship case, that there is no legal obligation on any trader to treat all his customers alike. Where such an obligation is deemed proper to be put upon traders, as on those who undertake to carry on enterprises under statutory protection, it is imposed by the statutes which give the protection sought by the trader. Nobody is compelled to apply to Parliament for a Railway Act or a Gas Act; but if it suits his purpose to do so, he must conform to the conditions in such cases made and provided. Unless a man's business is a statutory one, he can carry it on as he pleases, subject to the law of the land; and rigid uniformity of prices or abstention from discretionary dealing in any respect is not required of him.

It is a striking testimony to the extent of the statutory regulation of many important public services and industries in the public interest, that English people should regard the *Mogul* judgment as possessing any peculiar importance. It is one of the chief differences between commercial life in the United Kingdom and in the United States, that preferential, discriminating, or secret dealing is forbidden to our Railway Companies or Gas Companies, while it is the rule in the States. Such a fundamental difference of conditions renders a full comparison between these respective national arrangements impossible. When an extreme example of discriminating trading is brought into public notice—a case of boycotting, or of refusal on the part of workmen to work with a particular man—we are apt to think it is illegal. It is no more unlawful in essence than would be the refusal of a shopkeeper to sell a particular article from his window. The case is even stronger than this. It was decided in *Allen v. Flood* that it is not actionable to put pressure upon a person in order to induce him to do something which is not illegal. Thus a man may tell a shopkeeper that if he, the shopkeeper, has any dealings with a certain person, he, the communicator of the intimation, will refuse to patronize that shop. How much of this is done in country places for various motives, need not be asked; for information would never be forthcoming. Let us admit, however, that it would be canting hypocrisy to deny the existence of the practice on the part of people whose consciences do not accuse them of wrong-doing in this regard. Wherefore, it must be conceded that a workman has a perfect legal right to require his employer to choose between himself and another man. Nor is it conspiracy, or any other offence against the law, for a third person to inform the employer that unless he discharges one workman another will quit the employment.

It is different when oppressive actions, or acts calculated to lead to a breach of the peace, are imported into these considerations. Professed friends of Trade Unions have declared their inability to conceive how an organized strike can be legally carried on under the law as laid down in *Baldwin v. Leathem* and in the Taff Vale case. The difficulty is a manufactured one, and proceeds from some accepted definition of the term "strike" which is not avowed. What is a strike, by the way, in the legal sense of the term, if there is one? It is commonly understood to mean giving up work with a particular object belonging to a certain category. It is leaving work by way of making a protest. But if the ordinary meaning of the word is referred to as offering an explanation of its selection for this special application, it suggests force, even violence in the act. There is not necessary illegality in this; for a reasonable exercise of force or violence is quite permissible for the attainment of legitimate ends. Leaving work amid circumstances deliberately calculated to cause the greatest possible inconvenience and trouble to the employer, whether by one man or by all the men together, is an example in point. So long as no contracts are broken, and no laws outraged, a strike cannot be more illegal than a lock-out. Either may be terribly effective, without the smallest illicit accompaniment.

In regard to the Joint Committee on Municipal Trading, it is to be hoped that the very latest excuse offered for this form of enterprise, in connection with the proposal of the London County Council to establish an unprofitable passenger steamboat service on the River Thames, will be duly considered, together with profitable municipal gas supply. The last-named kind of business is the only one that pays; and it does so merely by virtue of the ability of the Managing Committee to fix the price of the gas at any figure they please. More than this it is impossible to prove. It does not seem a very high plane upon which to put the cause of municipal trading. In this connection, it may be pointed out that the attention of the Committee will probably be directed to the effect of borrowing, for trading purposes, upon the cost of municipal loans. This, and also the subject of municipal bookkeeping, will be brought before the Committee by several independent interests.

The Question of Depreciation Again.

The disconcerting revelations respecting the insolvency of most municipal electricity supply undertakings, referred to in our last week's "Electric Lighting Memoranda," have already caused some stir in interested quarters. We mention this subject here, in order that readers who may have missed the reference may give it the attention its importance merits. The current issue of the "Electrical Review" contains a somewhat impassioned protest from Mr. Horace Bcot, the Electrician to the Tunbridge Wells Corporation, against the writer's conclusions, which he endeavours to discount by referring to the practice of gas companies in regard to depreciation allowances. He declares himself "quite "satisfied to find that electricity supply authorities, either "municipal or otherwise, compare very favourably with the "majority of rival gas companies in the amount set aside "for depreciation;" and he states that he has before him "the balance-sheet of a very successful Gas Company, from "which he finds that it is not considered necessary to set "aside very large sums for depreciation in addition to "keeping the works in perfect repair from year to year."

It is not a monstrous supposition that the President of the Institution of Gas Engineers knows something about the particular Gas Company alluded to; and it may be granted without the least reserve that the fact is correctly stated by Mr. Boot. It is with respect to this same fact, however, that our friends and rivals, the electricians, are quite misled. While it is true that the word "depreciation" does not occur in gas companies' accounts, except in regard to leasehold lands, the provision itself is always there—assuming, of course, that the property is correctly managed—only it is included in the entries for repairs and maintenance. The word "maintenance" covers the provision which is in other places distinguished as depreciation.

British Gas Companies, being "perpetual corporations," do not return the proprietors' capital. If they were concessionary concerns, or if there were any term fixed for their financial existence, they would of course have sinking funds, as local authorities do. It is perhaps a little illogical, on the surface, that the gas capital of local authorities should be redeemable; but really the arrangement is a just one, because, with such few exceptions that they prove the rule, municipal gas undertakings have been acquired at prices largely in excess of structural value. The operation of the sinking fund on the original loan is therefore fully occupied for perhaps one-half of its period in imperceptibly writing off this excess, while the active capital is being continually increased by fresh borrowings. The charges against revenue for maintenance (including depreciation) of the plant meanwhile go on, irrespective of whether the capital is being redeemed or not. The question of the adequacy of this allowance is affected by many considerations. The Commercial Gas Company (London) are conceded to be frugally and wisely administered. They charge about 5d. per 1000 cubic feet sold for wear and tear and maintenance of works, distributing plant, meters, and stoves. The Birmingham Corporation Gas Department charge over 6d. per 1000 cubic feet under the same headings. The latter have sinking funds, the former have none.

It will be difficult, in the face of these figures, for Mr. Boot, or anybody else, to maintain that municipal electricity supply departments spend anything like so much on the upkeep of their establishments as is done by gas undertakings. In the Birmingham example, this amounts to nearly 25 per cent. of the total gas-rental. When the different character of gas plant and electrical plant is taken into consideration, the discrepancy of the two standards of husbandry becomes far greater. The lesson of these comparisons does not need emphasizing, although we shall take the liberty of repeating it as frequently as may appear to be desirable.

The Sittings of Parliament.

It is so rare an occurrence for the House of Lords, with their traditional prejudices, to evolve from their midst a proposal for any kind of parliamentary reform, that, when we are confronted by such a happening, it is something that most assuredly should receive profound consideration—more particularly when the idea is found to be one that has gained the sympathy of a vast majority of the House on first debate. Lord Newton was the author of such a proposal last week. Its intention was, and it served its purpose, to record the opinion of the House that Parliament ought to rise at the beginning of July, and that the time required for the due transaction of public business should be provided by Parliament sitting during a longer period of the winter than is customary at present. His Lordship's motion offered two alternatives. The first was that Parliament should meet in November, work for four or six weeks, adjourn for five or six weeks for the Christmas vacation, and then resume work—concluding the session by the beginning of July. The alternative was that the House should meet on Jan. 15, adjourn at the beginning of July, and reassemble in November to finish work. Looking at the matter, not from the public business point of view, but from that with which the gas industry and water supply undertakings of the country are more immediately concerned—the Private Bill work—the first proposal is the one that appeals most strongly to us, unless, of course, the procedure on Private Bills is so shortened as to permit of its easy negotiation during the period extending from Jan. 15 to the beginning of July. If it is not so shortened, then, it is to be feared, that an alteration to the second proposal would not mean relief from the occasional present congestion that is experienced in the Committee rooms, and there would be the danger of Bills that are opposed in both Houses being often hung up from July to November. This would not, as a rule, be to the interests of either promoters or opponents. In a few instances the delay might be useful; but, regarded generally, it would mean, in the case of the belated measures, increased cost, loss of time, and an undue continuance of anxiety for those concerned in the measures. Therefore the first scheme is, on the first blush, the one to be preferred.

The Proposal and Committee Room Work.

For our own part (and the feeling is shared by many whose duties call them to the parliamentary committee-rooms during the session), we should prefer to see an alteration in Private Bill procedure effected—by advancing both the date for the deposition of Bills and the preliminary formalities connected with them—so that the most important part of the work could be disposed of during the spring of the year; for in the summer months the crowded, stifling committee-rooms and corridors are ideal places only for those who like discomfort, and the conditions then are anything but desirable for the proper transaction of business. Members of Committees at such times have been known to exhibit symptoms of being bored; and even the interest of counsel has been observed to droop into a lethargic state. In making his proposition, Lord Newton (who is an experienced Committeeman, and this session has done excellent service as a Chairman, so that he knows what he is talking about) touched upon another point that has often been remarked upon in these columns. He put it in such a picturesque way that we cannot do better than reproduce his words. "When," he said, "there was a congestion of private business, their Lordships might see the leaders of the Parliamentary Bar (who were earning goodness knows how many thousands a year) rushing breathlessly from one committee-room to another, vainly endeavouring to be in two places at once and to do justice to their clients, to the complete bewilderment of the chairmen under whom private business was being conducted." It is a good thing to have the view of Lord Newton as a Chairman on this point. But, regarding it from the position of the clients of these legal luminaries, we happen to know that the effort to do justice is, at times under existing conditions, looked upon by those who have to pay as a vain and very dearly bought one. However, another Chairman of a Committee this session (Lord Clifford of Chudleigh) supported Lord Newton's motion; and the Earl of Rosebery, in one of his vivacious speeches, did not oppose it. Nor did he vote, having paired with Lord Monkswell, who was against the proposition. Lord Tweedmouth and the Earl of Morley feared that the consequences would not be those expected by the mover. The latter, by the way, made the announcement that he had been considering with Mr. Balfour the possibility of shortening the procedure for Private Bills. Lord Ribblesdale concurred in the motion, which, in the result, was carried by 88 votes against 26. But, of course, it is only an expression of the opinion of the House, and has no other effect than that of opening up the question. There is no doubt that the opinion of the Lower House will be the dominant one in settling the matter; but a remark by the Duke of Devonshire, that he thought one of the proposals worthy of experiment, seems to portend what may happen. Again, in the House of Commons, Mr. Balfour on Thursday stated that he personally should not object to meeting earlier; but he looked with some scepticism on the idea. The experiment might be tried; and, on the lines first laid down, we believe it would prove beneficial—leastwise so far as Private Bill proceedings are concerned. More work in winter, and less in summer, appeals to us as being the correct order of things.

Adoption of the Welsbach Reorganization Scheme.

The proceedings at the class and extraordinary general meetings of the Welsbach proprietors last Wednesday closed a chapter in the blemished history of that concern which has thrown a lurid light on the ease with which what is essentially only a commercial enterprise of an ordinary character can be promoted and floated with a capital on a scale multiplied many times beyond the point of reasonableness, and afterwards, to make matters worse, be mismanaged, without hindrance for a long

period, in a manner wantonly extravagant. Here, taking a most generous view of the present value of the goodwill of the business, 2½ millions of money have been lost to the proprietors; and it is to be feared that the number who have suffered are many compared with the number of those who have been enriched from this (to them) auriferous mine. This is only one of several similar lessons to be found in the City's financial records; and little good would result from pointing the moral of this particular instance. Investors and shareholders will continue to be beguiled, and give credence to plausible tale and specious argument, no matter what is said. However in the setting in order of the Welsbach house—and what a house it was!—the new Board and the Advisory Committee, with the adoption of their capital reorganization scheme last Wednesday, have passed through the worst and most unpleasant part of their task; and the fresh chapter opens well, and with the best of prospects. No one could expect proprietors would be very enthusiastic, or entirely at one, over a reorganization scheme which proposed the removal from even a paper existence of 2½ millions of their money; but it surprises us, as it has surprised many others, and will surprise many more who read the report elsewhere in this issue, that the Board in the end found their proposals opposed by such a comparatively insignificant minority of the proprietors. Of course no one likes to lose his money; but when a condition of things is inevitable, then the best plan is to face it boldly. So thought the Board, the Advisory Committee, and a considerable majority of the proprietors. The scheme may not have been an altogether ideal one; but it had the transcendent quality of being equitable. It was that virtue which recommended it so extensively. By passing the scheme with a minimum of opposition, the proprietors have given great encouragement to the Board, who will, as soon as the work of capital reorganization is out of hand, be able to add to their splendid services in the rehabilitation of the business by giving to it their whole attention. The next step, in order to give effect to last Wednesday's resolutions, is the presentation of a petition to the High Court for their confirmation.

A Junior Gas Association for Yorkshire.

The pages of the "JOURNAL" have of late contained numerous indications of the tendency of the junior members of the gas engineering profession to form themselves into societies for promoting their advancement. The Association which embraces the Manchester district is now firmly established, and is doing good work in the shape of discussions on technical subjects and visits to large manufactories. In the South, the band of young men who meet at the Regent Street Polytechnic under the presidency of Mr. Walter Grafton, F.C.S., have made an excellent start; and, judging by the papers read, abstracts of which have been given in our columns, they possess qualities which should find scope for their exercise in the not distant future. We have now to chronicle the birth of another organization of the kind, once more in the North. It will be seen by the report given in another part of the present issue, that a movement set on foot a short time ago has received sufficient support to allow of the formation of a Junior Association for Yorkshire, and that the first annual meeting will be held at Leeds at the end of October. It was at first intended to limit the sphere of the Association to the West Riding; but the wider area was decided upon, and in our opinion wisely. A Provisional Committee drew up a set of rules, in the framing of which a determined stand was made against including the "trading" element; and they were adopted, with some slight additions, at a meeting held in the Bradford Technical College on the 23rd ult. We learn from the Hon. Secretary *pro tem.* (Mr. Fred Scholefield, of Dewsbury) that already some forty persons have signified their willingness to join; and it is expected that this number will be greatly increased after the results of the last examinations at the City and Guilds of London Institute are known. So far, therefore, the efforts of those who took the first steps in starting the youngest of the young Associations have been attended with success; and we cordially wish them a continuance of it.

The Position of Corporation Officials.

The appointment of Mr. William Terrey as Clerk to the Metropolitan Water Board (which position he has, however, since refused), drew from the "Sheffield Independent" some sensible reflections on the subject of the insecure position held by municipalities so far as their heads of departments are concerned. We have on more than one occasion felt it to be a duty to call attention to the insufficient remuneration frequently offered by corporations to men who have spent many years of their lives in qualifying themselves to satisfactorily fill the post of a gas manager; and it is exceedingly gratifying to find a writer in the general Press who realizes, with us, how necessary it is to secure—and afterwards to keep—thoroughly capable and experienced officials to direct the public work of a town. Men of this character are neither common nor cheap; hence the need for a salary big enough to tempt them to come forward, and to retain them when found. Our contemporary is fully aware that this is an unpopular line to take, and that applause could be easily gained "by the easy method of pelting 'our highly-paid officials' with vague suggestions of extravagance and unprofitable service." Just so; but it is not always possible for a paper to say the pleasantest things or those which are likely to find acceptation most readily among its readers. There is a duty to perform; and the writer of the article in question recognizes this in calling attention as he does to a matter which is of far greater importance than is generally imagined. He admits that there are persons who will argue that it is possible to get any number of people at £500 a year who are willing to do any public work; but he contends—and we are in entire accord with him—that this is an utterly mistaken view to adopt. Any number of people can be obtained who are willing to try to fill an official position, or who are desirous of learning at the expense of the ratepayers; but it is impossible to get an unlimited number who are capable of undertaking, without grave risk, the enormous responsibility of work which, in the end, may total up to millions of pounds of public money. "Everybody," he says, "who has seen at close quarters the work which a great city demands of its directing officials, and realizes the kind of capacity and experience required, knows that these qualities cannot be got by taking the low bidders at their own valuation. Managing minds are not common, and not cheap. The best are worth having at the full market price." No one knows better than do the readers of the "JOURNAL" how true all this is—and no one knows better than they do, also, how little understood the truth of it generally is.

The Example of Sheffield

There are, of course, some corporations who are fully alive to the necessity of offering a good price if it is desired to obtain a good article—and, indeed, the object of the writer in the "Independent" is not so much to show that the salaries in Sheffield are too low, as to prove that the officials there are not overpaid, as things go. He wishes the citizens to realize that municipalization is a gigantic business, and that good brains must be kept at the head of it. There are departments in the Corporation which to his own knowledge have not a single important official in them who is not liable to leave at once of his own accord for something better; and, this being so, he thinks that those members of the City Council who know the position, ought to have the pluck to show the true bearings of the facts to their friends and supporters and the public, and ought not to court a shallow popularity by vague talk about a cheapness which does not exist. They ought not to lead the public to think that the heads of public departments in the city are over-paid when, as a matter of fact, they are being tempted all round by higher salaries. As has already been remarked, it was the proposed removal of Mr. Terrey to London, at a commencing salary 50 per cent. higher than he is at present receiving at Sheffield, which in the first place gave rise to these reflections (though it is fully recognised that London would be Mr. Terrey's proper sphere of action); but our contemporary says it is quite conceivable that the same opportunities of promotion may occur to the other chief officials of the Corporation, all of whom are as much at the head of their respective professions as Mr. Terrey is of his. It thus requires no great call on the imagination "to picture the Sheffield of five years hence denuded of its present officials, and the city's business, and health, and legal policy in the hands of untried men, who may not even inherit the traditions of the successful past." This is perhaps a rather too gloomy view to take of the position; and even if the present officials did all leave, it is quite conceivable that their positions might be filled by other equally able men. Still, of course, there is the chance—and it is too great a

chance to be risked, if it can possibly be avoided—that such might not turn out to be the case; and therefore the "Sheffield Independent" is doing good service in so prominently directing public attention to the matter. In so far as it is a question of money—and there is no hint that any other consideration has entered into the question—the Corporation, of course, have the remedy in their own hands. All they have to do is to remunerate their officials in such a manner that they are not likely to be "tempted all round by higher salaries." This should be worth doing, considering the enormous magnitude of the city's business.

And Its General Application.

But though the case now in point is Sheffield, what has been said is equally applicable to other municipal bodies, many of whom would find it greatly to their benefit if, after securing by means of the offering of a sufficient inducement, the best men available as their servants, they did everything in their power to retain them in their employ. We frequently come across cases in which corporations liberally increase the salaries of their gas managers when they find that someone else is willing—nay, even anxious—to pay them more than they themselves have been doing; but this kind of recognition of merit might often be made very much more gracefully (and with no more than mere justice) before such pressure was brought to bear. The desire to better oneself is a general, and very natural, one; and, of course, the higher positions in the gas and water profession must always attract the best men from less important places. That is a contingency which no action on the part of employers can, or should, prevent; but it is not such cases as these that we have in mind while writing in this way. We are thinking of instances in which men are being paid, not less than their services would be worth to someone else, but less than they are worth to those in whose employ they may at present be.

Early Lighting of Rochdale.

A very interesting article on the early lighting by gas of Rochdale, by Mr. R. D. Mattley, appeared in a recent issue of the "Rochdale Observer;" and it betrays an intimate knowledge on the part of the author of the conditions which existed in this far-away time. The town was first lighted with gas in 1824, when the undertaking was in the hands of the Company of Proprietors of the Rochdale Coke and Gaslight Works—a syndicate of local capitalists who obtained a parliamentary monopoly of supply on the grounds that, as the preamble to the Act recited, "the town of Rochdale was a large and populous place, and it would contribute much to the safeguard and advantage of the inhabitants and the public at large if the streets and other public passages and places therein and the suburbs and vicinity thereof were lighted." The first Manager was Mr. Josiah S. Lancashire, who held office for twenty years, when the concern was taken over by the Commissioners. The Company's Act provided that the works, which were estimated to cost £12,000, should not be commenced until this sum was subscribed. There was no limit at all to the gas charges, except with regard to the public lighting, in respect of which the Company were under obligation to supply gas of such quality as should at all times afford a cheaper and better light than could be obtained by means of oil-lamps; and one of the clauses of the Act was to the effect that no person should use any burner of larger dimensions nor more in number than he, she, or they should respectively contract or pay for, on pain of forfeiting £10, and other penalties. Power was given to purchase lands not exceeding 3 acres in extent; and works consisting of a retort-house and two gasholders were erected. Naturally, the formal opening (in May, 1825) of such an important local undertaking was made the occasion of considerable rejoicing. The day was proclaimed a general holiday; and a feature of it was a balloon ascent from the works. To fill this balloon, 26,000 cubic feet of gas was required, which was nearly three-fourths the capacity of one of the gasholders!

Customs Which Still Prevail.

The lighting season at Rochdale extended from the beginning of October to the middle of May; and the writer of the article remarks that "for two or three days before and after full moon, no matter whether her lunar majesty put in an appearance or not, the belated wayfarer was left to find his destination as best he could—no lamps were lighted." This may have been a foolish practice; but considering that even at the present time it prevails in many places, it is hardly surprising to find that examples of it existed seventy and more years ago, when not so many people were abroad at night as is the case nowadays. After such a pleasant start, it is disappointing to learn that the lighting movement soon received a provoking check. Mr. Mattley remarks that "investors would seem to have been as eager after 'divi.' then as they are to-day; and the gas proprietors proved no exception to the rule. Those individuals had acquired a monopoly—at considerable expense, it is true—and, not being a charity organization committee, they took a precipitate course to obtain a return for their outlay on the works and mains. They fixed the gas charges at a high figure; and the service they gave was poor and limited. The Company was dominated by a short-sighted policy; and the mains that were laid were too small for the purpose they were intended for, with the result that in a space of a few years the inhabitants were greatly incommoded." In consequence of these and other grounds of complaint, he says, the inhabitants boycotted the new illuminant; and in this attitude they were sustained by the Commissioners, who, at their meetings, upbraided the Company in unqualified terms. Of course, it is quite possible the Company were in the wrong; but the fact that the Commissioners "upbraided" them is not conclusive evidence of the fact. After the lapse of so many years, local authorities all over the country still continue to censure the suppliers of gas, who, as a rule, are doing their very best for the consumers, and consequently for themselves. We are inclined to think, therefore, that the Rochdale Gas Company may not have been quite so black as they have been painted. Of this, however, it will be better possible to judge after reading the further article which Mr. Mattley promises, dealing with the dispute between the Company and the Commissioners, which culminated in the latter taking over the gas undertaking. In these days, when it is necessary to devote so much attention to looking forward, it makes quite a pleasant change to take an occasional glance backward at the times of long ago; and we are grateful for this opportunity of doing so.

Annual Meeting of the Italian Gas Society.

The "Gasisti d'Italia" will hold their thirty-second meeting (or *conferenza*, as they call it) on the 10th, 11th, and 12th of this month. Last year they met in Turin; but this year a city quite at the other end of Italy is chosen—namely, Palermo, the capital of Sicily. Thus, the journey for some members will be a long one—farther, even, than from (say) London to Milan. Palermo is lighted by the Società Italiana per il Gaz; and it is in this Company's offices that the meetings will be held, under the presidency of Sig. Leone Lebreton. The programme includes the usual business items, the presentation of accounts, the election of new members, the installing of the year's President, and the technical papers. These last are not cast in the hard-and-fast form customary with us, but partake of informal discussions upon such subjects as crop up at the time, and concerning which information may be desired. The advantages of this are obvious when the length of the country, and the scattered positions held by the members, are called to mind. We trust our Italian colleagues will have a very successful and useful meeting.

WATER AFFAIRS.

Opening of the Metropolitan Water-Works Purchase Arbitrations.

THE three Arbitrators—Sir Edward Fry, Sir Hugh Owen, G.C.B., and Sir John Wolfe Barry, K.C.B.—appointed under the Metropolis Water Act, 1902, to appraise the value of the undertakings to be acquired by the Water Board, held their first meeting last Friday, according to arrangement, under the presidency of Sir Edward Fry; and a report of the proceedings before them will be found in another part of the "JOURNAL." As mentioned last week, the claims of the

Companies had all been lodged by the 16th ult.—that of the New River Company heading the list. Mr. Balfour Browne, K.C., and other Counsel were in attendance on behalf of the Companies; and Mr. Fletcher Moulton, K.C., appeared for the Board. The Urban District Councils of Tottenham, Enfield, and a number of places in Kent were likewise represented. The first matter to be considered was an application that the last-named bodies might be allowed to appear and be heard in the arbitration in connection with the Kent Water Company, as they were desirous of forming themselves into a Joint Board to acquire the Company's works and supply their district. It was urged that the price to be paid to the Company would regulate the amount the proposed Board would have to give for the undertaking, and therefore they ought to be allowed to be represented when the price was fixed. The Arbitrators, however, did not see the necessity for this; and they refused the application, with costs.

After this rebuff, things went along pretty smoothly. Mr. Moulton objected that the statement of claim put in by the New River Company was inadequate for the purpose of enabling the Water Board to determine what they would give for the undertaking; and Mr. Balfour Browne gave a promise that the required particulars should be supplied. He suggested that the Accountants of the Board and the Company should meet and see how far they could agree with regard to the figures to be put before the Arbitrators. Mr. Moulton fell in with the suggestion; and Mr. Cripps, K.C., for the West Middlesex Company, acquiesced. It was arranged that special plans of the New River Company's properties should be submitted, that others showing the mains should be open to inspection, and that various financial details in regard to other Companies should be given. In the result, the Companies were ordered to submit amended claims. The Court adjourned till the 26th of October, when they will take the case of the East London Company first and that of the New River Company next; and they hope to continue their sittings day by day. The meetings of the Accountants of the respective parties in the interim should facilitate the presentation of the cases of these Companies in the most convenient form for adjudication; and possibly they may serve as precedents for the settlement of the remainder. However this may be, a conciliatory spirit seemed, on the whole, to pervade the proceedings on Friday; and it may be hoped that this will be a characteristic of future meetings.

Progress of the Lambeth Company.

It was not until the accession of Viscount Hampden to the chair of the Lambeth Water Company that the proceedings at the half-yearly meetings of that body were allowed to be made public through the newspapers. We could never quite understand the reason for the former secrecy, when the majority of the London Water Companies opened their doors to the Press. It certainly could not have been because the Directors were afraid of their management being criticized, because the undertaking has been a thoroughly progressive one, as shown by statistics for the past ten years cited by the Chairman in his speech last Tuesday. Between March 31, 1893, and the corresponding date in 1903, the gross revenue advanced to the extent of £88,686, whereas maintenance and management charges increased by £54,177 only. The number of supplies was augmented by 31,225; and the rate of dividend on the 10 per cent. capital went up 1½ per cent.—being 11 compared with 9½ per cent. Against these figures, however, must be placed a serious rise in the rates and taxes, from £18,444 to £33,175 a year, exclusive of income-tax—a fairly high jump. In the past year, absolutely new expenditure to the amount of £10,500 (of which £6300 went to the Chamberlain of London and £3000 for the Water Bill) had to be incurred, compared with ten years ago. However, the Company managed to realize a net profit available for distribution among the proprietors which was £2128 more than at the end of the preceding year; while the new business in the past six months was the largest recorded for any winter half year in the history of the undertaking. Truly, as Viscount Hampden remarked, the life of the Company is drawing to a close just at the time when its prospects are at the brightest; and we unite with him in expressing the hope that the Arbitrators will take this circumstance into consideration in fixing the amount of compensation to be paid to the owners for parting with their successful business.

ESSAYS AND REVIEWS.

THE GAS AND WATER STOCK MARKET.

(For Stock and Share List, see page 604.)

Last week was not favourable to stimulating the volume of business on the Stock Exchange; and had it not been for the fortnightly settlement, there would have been hardly anything at all to note. The brilliant weather, the Epson Races, and the advent of the Whitsun Holidays, all combined to handicap business most effectually. And yet the week was by no means destitute of excitement, for there was a good deal of wild speculation—mostly in the American Market. This jumped about nervously, which kept things in general from stagnating, and which will probably be found to have rendered the settlement a matter of anxiety in some quarters. In the Money Market, there was brisk demand in connection with the Stock Exchange settlement and for other requirements, which stiffened rates appreciably. In the Gas Market, business continued very much below the par of activity; and for some reason or other, nothing seems able to rouse the market from the listlessness and lack of animation which so obstinately possess it. The probabilities for some little time past would have seemed to point to a revived demand; for the industry in general is doing very well, though some slight disappointment is likely to be felt in regard to coals not being procurable at as great a reduction below last year's contracts as had been expected. In Gaslight and Coke issues, business was very moderate; and the price, which at the opening was none too strong, fell away gradually to 85, and the quotation receded a point. The secured issues were not much dealt in; and their figures, too, were inclined to greater ease. South Metropolitan was an agreeable contrast; the price gradually improving, and the quotation scoring an advance. Commercials were in no demand, and were quite neglected. The Suburban and Provincial group provided only two or three bargains, and all quotations remained unchanged. The Continental Companies were the most interesting, and showed the greatest strength, though transactions were very limited. Union had a further recovery of 4½, and Imperial advanced 1½. The undertakings in the remoter parts of the world were not very conspicuous. In the Water Companies, the feature of the week was the swinging of the pendulum the other way, after the giant strides which the quotations have recently been making in advance; and the three Companies which had scored the highest, had to come down slightly last week.

The daily movements were: On Monday, Union rose 2½, and Imperial ½. In Water, Southwark fell 2, and Grand Junction 1½. On Tuesday, Gaslight ordinary fell 1. Southwark Water fell 1. On Wednesday, Union rose 2, and Imperial 1. On Thursday, South Metropolitan rose 1. In Water, New River fell 5, and Southwark 2. The Stock Exchange closed on Friday evening till after Whit Monday.

ELECTRIC LIGHTING MEMORANDA.

The Changes of Ground of Partisans of Municipal Trading—Wanted a Form of Town Councillors' Articles—The Case of Kingston Again—The Troubles of Poplar.

A very obvious change has come over the advocates of municipal trading, or rather, as it might be classified with equal truth, of the direct employment of labour in public services carried on with capital provided on the security of the rates. At one time, the argument in support of this order of enterprises being conducted by local authorities was based chiefly, if not entirely, on the alleged profits to be made in aid of the rates. The facts not adequately supporting this pretence, the ground was shifted to that of the asserted superior cheapness and efficiency of municipal services, as compared with company working. The ground failing again, the argument was changed once more, and one would fain hope placed upon a last contention, which was that the ratepayers might reasonably be called upon to bear the loss of carrying on public services considered to be of general advantage. The London County Council have run the gamut of all three pleas for spending money on public works and services; and it is difficult to imagine what other excuse they can hit upon, except the open declaration that they like doing this sort of thing. Of course, if Parliament, and those who will have to find the money, are of the same mind, there is no more to be said; but this is what remains to be proved. In other words, the case for expediency will have to be made out every time.

The difficulty here is that, whereas it is the local authority, acting as an executive body, which decides to go in for electricity supply, or whatever happens to be the Progressive craze of the moment, the ratepayers, who have to find the money, have only very limited power of control, and practically no knowledge as to how best to exercise it. Ratepayers elect, or more truly permit elections to go on, which result in placing certain persons, of whom they know little, in a position to initiate or support matters of policy of which they know absolutely nothing. Although the representative quality of members of local authorities is strictly

limited by law, nobody pays any attention to this fact. There ought to be a sort of "penny form" of town councillors' articles, familiar to both electors and elected, which all candidates for municipal honours should subscribe; and this should end with a solemn declaration to the effect that nothing should be done beyond the ordinary duties of the local governing body without ample preliminary consultation between the ratepayers and their representatives. As it is, aldermen and town councillors get "views," which they impose upon the local public. They do not ask themselves how far they are justified in posing as leaders of local enterprise. They even resent the suggestion that ratepayers ought not only to be consulted, but also to be first instructed on any extraordinary projects advanced in their name. Consequently, it is too often a case of the blind leading the blind, with the usual result.

An instructive instance of this kind is the electricity supply of Kingston-on-Thames, which has several times been mentioned in this column, for the reason that it is a typical one. As usual, municipal electric lighting in Kingston was going to materially assist the rates. The leading aldermen and councillors of the period believed this, and were impatient of the meekest sceptics on the point. They were very cocksure about it, scouting all opposition based on the presumptive character of the merits of their scheme. Some of them have lived to learn wisdom, but unfortunately after it is too late to exercise it. The same experience is being repeated all over the country. The aldermen of ten years ago, or thereabouts, who so confidently expected that electric lighting was competent to return handsome profits, have in many instances left the scene in which they were the dominant figures. But their work remains behind; and it has not justified the expectations formed of it. At Kingston an expert—Mr. Burstall—has been called in to investigate the causes of the disappointment; and the publication of his report, which we have discussed, has only deepened the prevailing gloom with which the municipal electric lighting department is now being regarded. The worthy Alderman who was largely responsible for the starting of the venture, and had retired from the chairmanship of the Lighting Committee, reappeared at the last Council meeting to complain that Mr. Burstall had not told them how to make the undertaking pay. As if any matter of this kind could be dealt with by a prescription! Mr. Burstall is no quack. He has no sovereign cure for the constitutional weakness from which the Kingston electric lighting undertaking, like most others of the breed throughout the land, is suffering. Congenital weakness is not to be cured by merely calling in "further advice," however eminent.

The state of affairs in the Metropolitan Borough of Poplar, to which reference was made in this column last week, naturally continues to excite local criticism of the authority responsible for the unsatisfactory electricity supply. It is so far gratifying to observe that the powerful indictment of municipal trading methods in this regard, which has recently appeared in the "Electrical Review," has already been taken to heart by local critics of the Poplar enterprise, and the test questions as to the correctness of the accounts and the adequacy of the depreciation allowances are applied to the local example. Here as well as at Kingston, the first question of policy, apart from these matters of book-keeping, relates to the open capital account. Mr. Burstall seriously upset the Kingston Corporation by warning them that interminable extensions are not the right way to make both ends of an undertaking meet. Dr. Kennedy said something similar of Manchester. The same has been discovered at Poplar, where, although the Committee declare that the generating plant is already so much overloaded that they must refuse all additional connections, fresh extensions are declared to be necessary before any profit can be realized. The Borough Council, with a gleam of reasonableness which does them infinite credit, have refused to countenance the extensions until the business already in hand can be proved to pay. Nay, more—it is asserted by a writer in an East London newspaper, who professes to know, that so much has already been charged to capital in the case of Poplar that the sale value of the undertaking would not amount to half the actual cost. This is the reverse side of the picture that is always exhibited whenever a company's undertaking is acquired by a public authority. There is always a premium on the capital expenditure to be paid for such property; otherwise, of course, there would not be any attraction in the bargain. Local authorities have no ambition to buy unsuccessful undertakings; and they are not justified in doing so, in a general way. There are exceptions, of course. It rarely occurs to local authorities owning undertakings of their own creation, in respect to which no payment was made for goodwill, to inquire whether they have succeeded in creating a valuable property of this kind. In the Poplar case, the good advice is proffered that the Borough Council should square their electric lighting accounts in the spirit of the Bermondsey clause, so that those ratepayers who want the light should pay for it fairly, and not enjoy it at the expense of others.

We regret to learn that Mr. A. W. Archer, the Manager of the Enfield Gas-Works, has lately sustained a severe bereavement by the death of his wife. The interment took place at the Enfield Highway Cemetery last Tuesday, when many tokens of respect and sympathy were shown by friends of the deceased lady resident in the neighbourhood.

FROM EARLY VOLUMES OF THE "JOURNAL."

July 10, 1849.

An esteemed correspondent in Paris has transmitted to us a translation of the contract under which that city is now lighted with gas. The circumstances under which this contract was concluded are instructive, and contrast favourably with the headlong course adopted by some corporate and municipal bodies in this country, in the pursuit of what is often miscalled economy. In the origin of gas lighting in Paris, simple revocable permissions were granted by the authorities to various companies to lay down pipes for the supply of gas, without the stipulation of any express condition as to the terms upon which the supply should take place. In no case, however, was more than one authorization granted for the same district, of which the actual possessor had, therefore, the unrestricted monopoly. Under such patronage many of the companies became rich and powerful, so much so as to attract the envy and jealousy of a large and wealthy portion of the Parisian public; and in 1846, various attempts were made to encroach upon their hitherto respected rights, and a Commission of the Department, composed of its most intelligent and respectable citizens, was appointed to examine the question. Proposals of the most seductive kind flowed in upon them; but good sense and a strong perception of what was due to those who, in less encouraging times, had been induced to embark their fortunes in a novel branch of industry, maintained their ground, and resulted in a contract which we apprehend will be found to conciliate the interests of all parties. The cost of gas in Paris may be estimated at 1s. 8d. per 1000 feet more than in London, arising from the high price of coal, difficult sale of coke, and increased expense of wear and tear. Making due allowance for this extra cost, we shall see that the Parisian prices are such as will, in all probability, enable the companies to pay back a large portion of their capital during their seventeen years' monopoly, and at its expiration they will be able, by reason of their position and situation with regard to the mains, to offer to manufacture gas for the authorities on more advantageous terms than a new company; while, on the other hand, the authorities having become proprietors of the mains, will protect the gas consumer against any excessive charges. Should, however, the old companies refuse to continue to supply gas on the conditions proposed to them, they would suffer little from ceasing operations and disposing of their works; the land on which most of them are erected having so much increased in value as to pay for the constructions put upon it. As the prices for public lights are quoted at per light per hour, we have below calculated what the price would be according to our system of burning.

Prices in the Central Parts of the City.

3·5 feet per hour for 4400 hours	. . .	£4	5	7	per light.
4·9	,,	,,	. . .	6	0	3	,,
7·0	,,	,,	. . .	8	11	7	,,

Prices in the Outskirts.

3·5 feet per hour for 4400 hours	. . .	£6	3	2	per light.
4·9	,,	,,	. . .	8	12	4	,,
7·0	,,	,,	. . .	12	6	0	,,

Extra allowance for repairs, painting, &c., 12s. 2d. per lamp.

Some of the regulations may appear harsh and stringent; but, where prices like the above are paid, the authorities have a right to be well served, and few cities can equal Paris in the efficiency with which this department of its administration is conducted.

Aug. 10, 1849.

It is with much satisfaction we announce to our readers that measures are now in progress for the formation of an Institution of Gas Engineers, under the patronage of several of the most eminent men of the profession, including those to whom we are indebted in a great measure for the advancement of gas lighting in its earlier stages. The advantages which must result from an Institution of this nature, both to those associated and to the public, have been so frequently and earnestly urged upon us by our numerous correspondents, that we should have laid ourselves open to the imputation of apathy had we delayed eliciting the opinion of the heads of the profession upon this important subject; and we are happy to say that, with few exceptions, it has been given in the affirmative. Some, indeed, may have had doubts whether a body, numerically small compared with other associated bodies, could carry out and support such an undertaking. But none have doubted its utility; and we are satisfied that there are ample elements for the formation and maintenance of such an Association. Our own subscribers will, indeed, form a strong body of themselves. We hope to be able in our next number to give an outline of the project. Suffice it at present to say that, though the seat of the Institution must necessarily be in the Metropolis, yet it is proposed to hold annual meetings in the larger provincial towns in the vicinity of the great coalfields, such as Birmingham, Newcastle, &c., on the plan of the British Association. Such meetings cannot fail to be highly instructive and useful to the profession and those connected with it. A model-room, library, and museum of coals, classified and arranged according to the value of their gaseous products, would, of course, be one of the objects to which the early attention of the members would be directed.

THE GRANTON WORKS OF THE EDINBURGH AND LEITH GAS COMMISSIONERS.

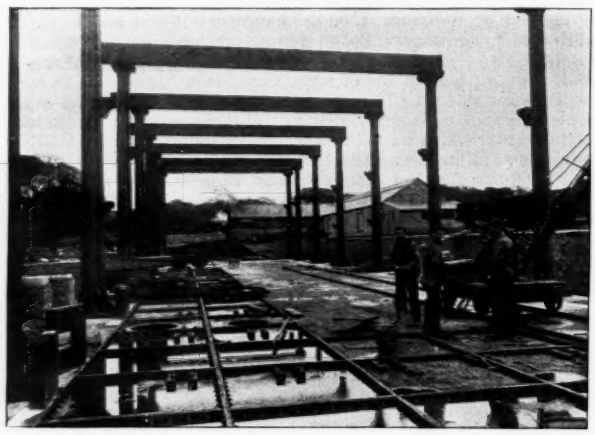
DESCRIPTION PREPARED

BY

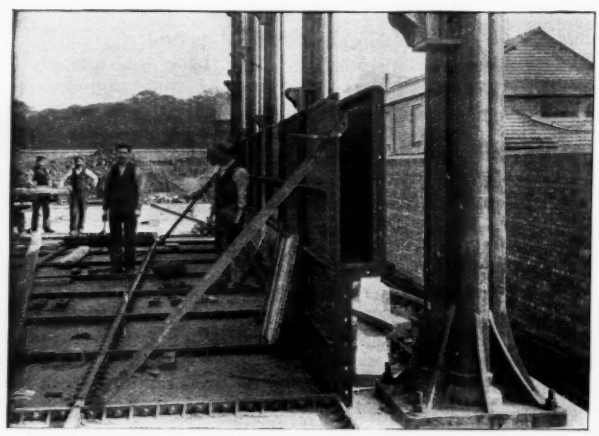
WALTER RALPH HERRING, M.INST.C.E., *Engineer.**

ARTICLE XXI.—Accompanied by Plate No. 22, giving Details of the Purifiers and Covers.

The purifiers and covers do not call for any special note at this stage. They are of the water-lute type, with a lute 3 ft. 6 in. deep by 8 inches wide, cast upon the side plates. The tanks consist of cast-iron flanged-plates, with faced joints to the details shown on Plate No. 22. Each section of six purifiers consists of one continuous tank, 270 feet long by 30 feet wide inside, partitioned off into six boxes by means of division plates with double lutes. The cast-iron boxes are stayed internally by the



PHOTOGRAPH No. 108.—Bottom plates of the purifiers, showing the inlet and outlet apertures.

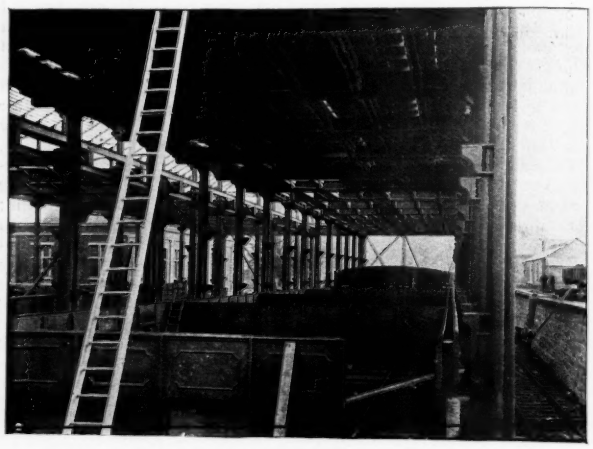


PHOTOGRAPH No. 109.—The purifier side-plates, with lute cast on.

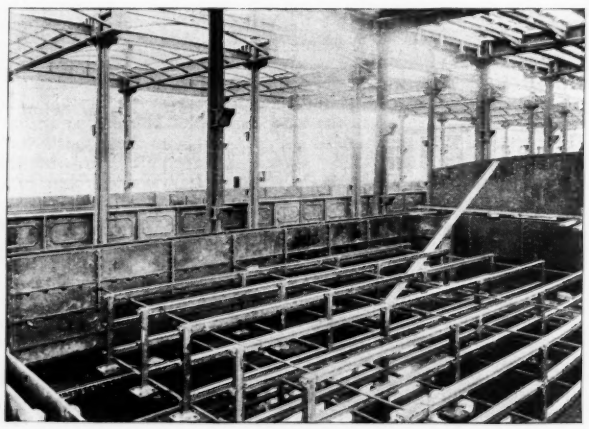
T steel sieve-bearers longitudinally, and transversely by means of 1-inch diameter tie-rods with coupling boxes, attached at a point about 3 ft. 10 in. above the bottom of the box, and supported by means of hook-bolts from the underside of the sieve-bearers. The water-lute is 8 inches wide and 3 ft. 6 in. deep. The bottom plates of the purifiers are 5 feet square by $\frac{3}{4}$ inch thick, with flanges $3\frac{1}{4}$ inches deep by $\frac{7}{8}$ inch thick, having holes for $\frac{3}{4}$-inch bolts at 6 inch centres, stiffened between each bolt hole by means of $\frac{1}{2}$-inch brackets.

Suitable bases are cast upon certain of the bottom plates for supporting and attaching thereto the sieve-bearer standards, which are small (4 inch square) cast-iron pillars 4 feet high. The lines of the sieve-bearers are placed longitudinally with the box, and are 3 ft. 9 in. centre to centre. They consist of 4 inch by 4 inch by $\frac{1}{2}$ inch T steels, and are supported upon ears cast upon the sieve-bearer standards, and to which they are bolted to form a longitudinal tie for the boxes. The length of the sieve-bearers between the supports is about 8 ft. 9 in. The bottom plates have internal flanges, and are jointed on the inside of the boxes; the bottom lying upon the cement concrete foundations. Sand is used for bedding the plates, to overcome any slight inequalities in the castings. The side plates are 5 ft. wide by 6 ft. $3\frac{1}{4}$ in. high over all; the lute being cast upon the side plate with internal and external flanges, faced, stiffened, and bracketed as shown. The pitch and the size of the bolts are the same as on the bottom plates; the substance of the plate being $\frac{3}{4}$ inch thick, and the outer face of the lute being relieved by a moulded panel and a bold bead-mould on the upper edge.

The details of the various parts shown upon Plate No. 22 are



PHOTOGRAPH No. 110.—The purifier tanks, with their common division lutes.



PHOTOGRAPH No. 111.—The longitudinal and transverse stays.

sufficiently explicit to render further explanations unnecessary—excepting, perhaps, that special attention may be called to the method of distributing the gas under the bottom layer of material in the box. When referring to the question of foundations, it was pointed out that the inlet and outlet connections with the boxes were made at the nearest possible point, the inlets and outlets in most cases being immediately alongside each other. This was done to avoid any costly and complicated construction of pipe-trenches beneath the purifier boxes themselves; means being taken to distribute the gas within the purifiers beneath the bottom layer of the material. This was accomplished by inverted cast-iron troughing laid across the bottom of the box, perforated at the sides so as to ensure a thorough and equable distribution of the gas beneath the bottom layer of material. These cast-iron troughings (open at the bottom) were laid across the flanges of the bottom of the boxes, and brought immediately over the inlet pipes, for some little distance from which no perforations are provided.

Photograph No. 108 shows pretty clearly the positions of the inlet and outlet of one of the boxes. The bases for the sieve

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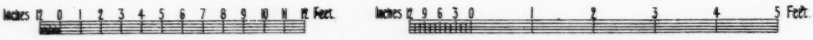
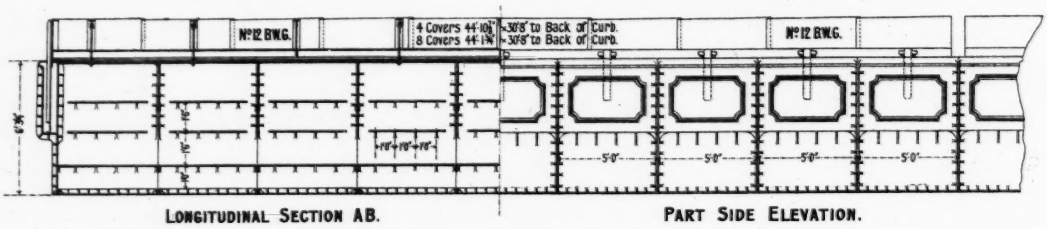
The Granton Works of the Edinburgh

Details of the Purifiers a



DETAILS OF PURIFIERS AND COVERS.



LONGITUDINAL SECTION AB. PART SIDE ELEVATION.

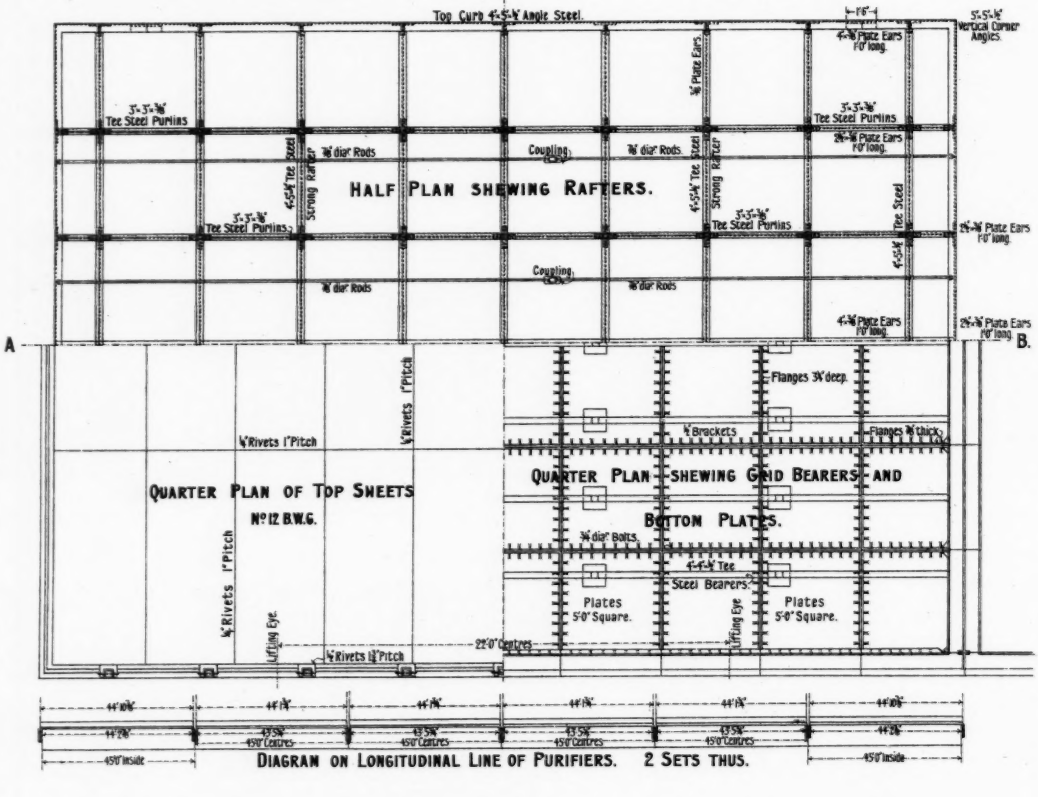
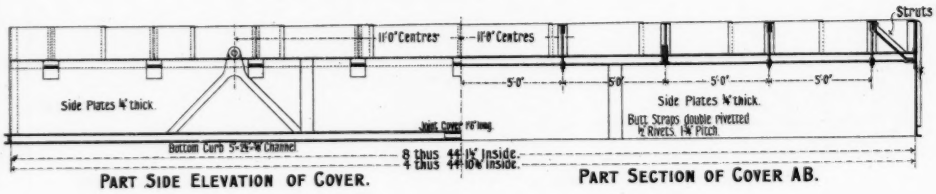
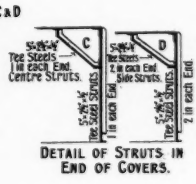


DIAGRAM ON LONGITUDINAL LINE OF PURIFIERS. 2 SETS THUS.

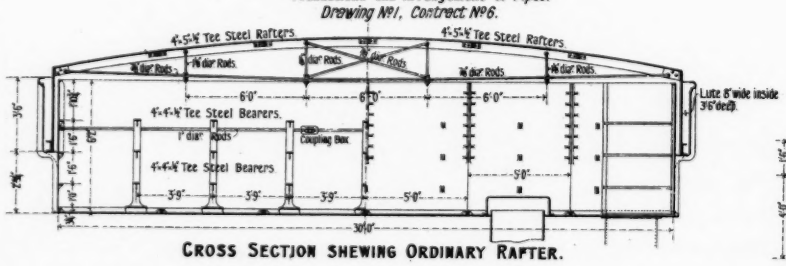


PART SIDE ELEVATION OF COVER. PART SECTION OF COVER AB.

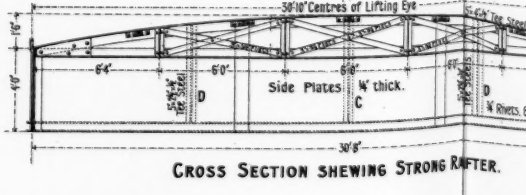


DETAIL OF STRUTS IN END OF COVERS.

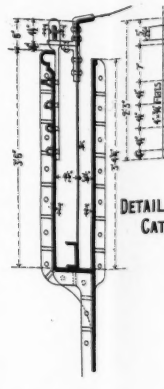
NOTE – For Details of Inlet and Outlet Pipes See Plan of Foundations and Arrangement of Pipes. Drawing No 1, Contract No 6.

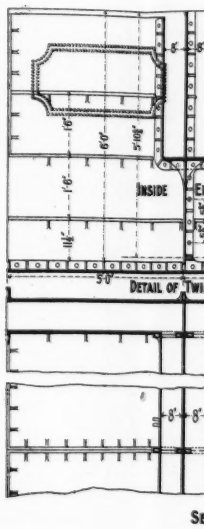


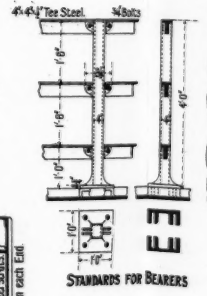
CROSS SECTION SHEWING ORDINARY RAFTER.

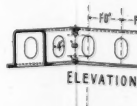


CROSS SECTION SHEWING STRONG RAFTER.









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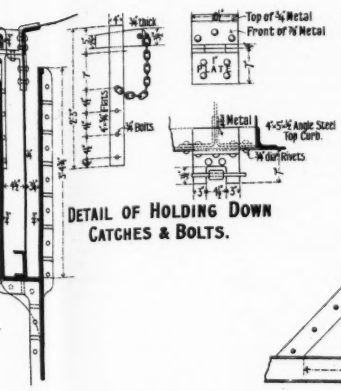
burgh and Leith Gas Commissioners.

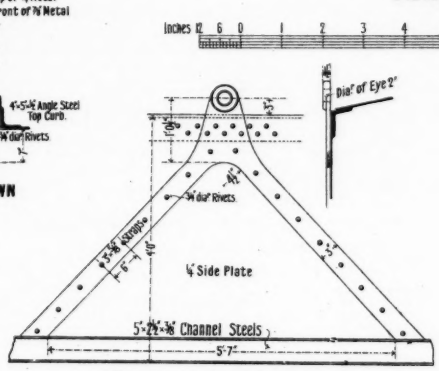
urifiers and Covers.

No. 22.

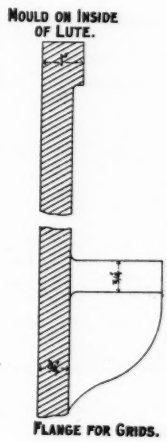
DETAILS OF PURIFIERS.

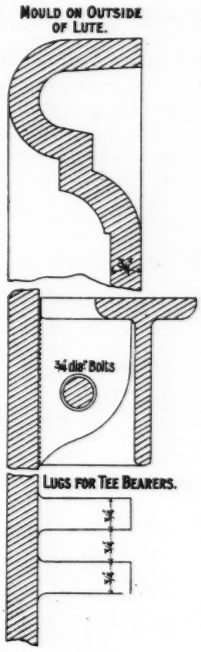


DETAIL OF HOLDING DOWN CATCHES & BOLTS.

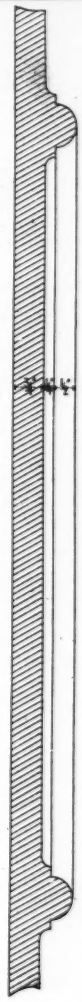


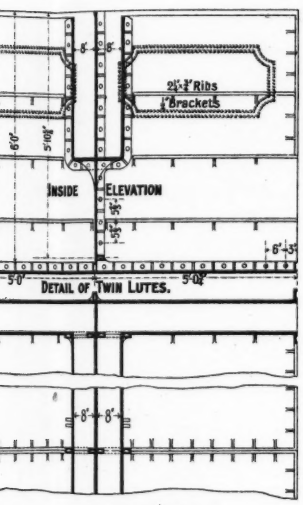
DETAIL OF LIFTING EYES.





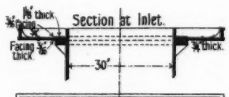
FLANGE FOR GRIDS.

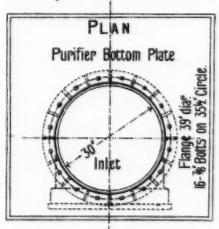


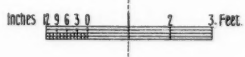


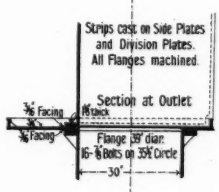
DETAIL OF TWIN LUTES.

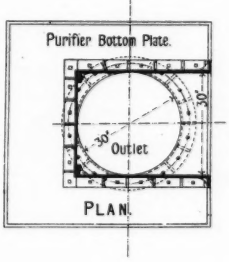
SECTIONAL PLAN

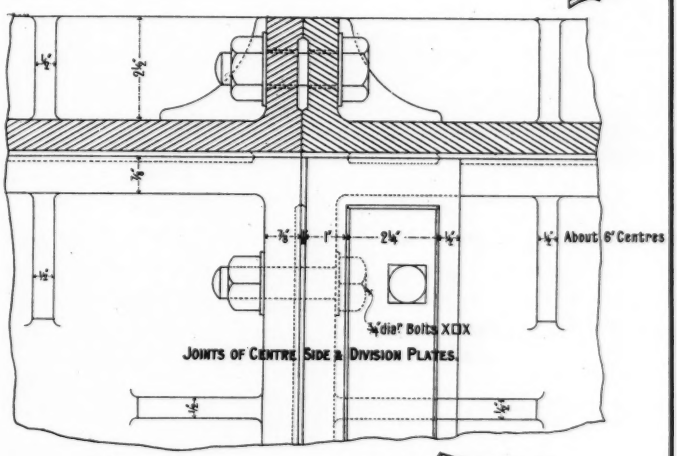




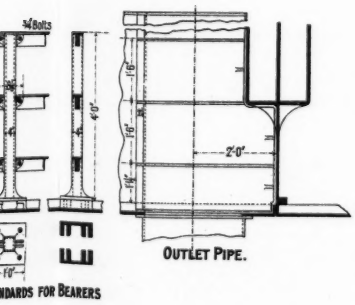






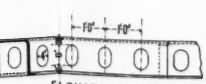


JOINTS OF CENTRE SIDE & DIVISION PLATES.



OUTLET PIPE.

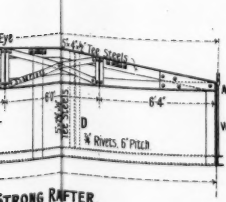
NDARDS FOR BEARERS



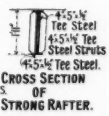
ELEVATION. *NOTE – See Drawing No1. Contract No6 for Arrangement in Purifier Boxes.*

TRANSVERSE SECTION.

GAS INLET HOOD.

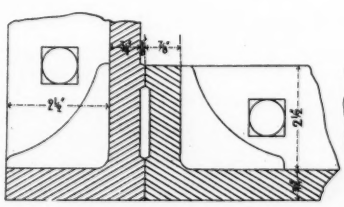


STRONG RAFTER.

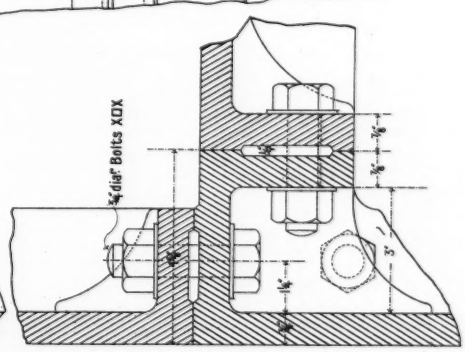


5"·4"·½" Vertical Corner Angles.

CROSS SECTION OF STRONG RAFTER.



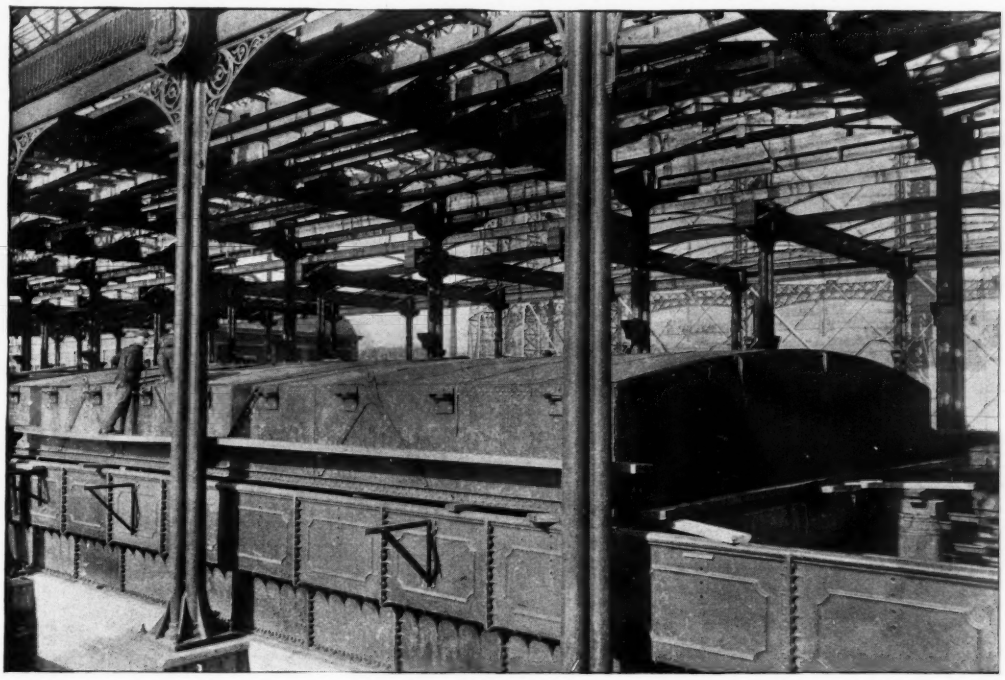
ORDINARY FLANGE & SIDE JOINTS.



JOINT OF BOTTON AND DIVISION PLATES.

WALTER RALPH HERRING,

M.INST.C.E., *ENGINEER.*



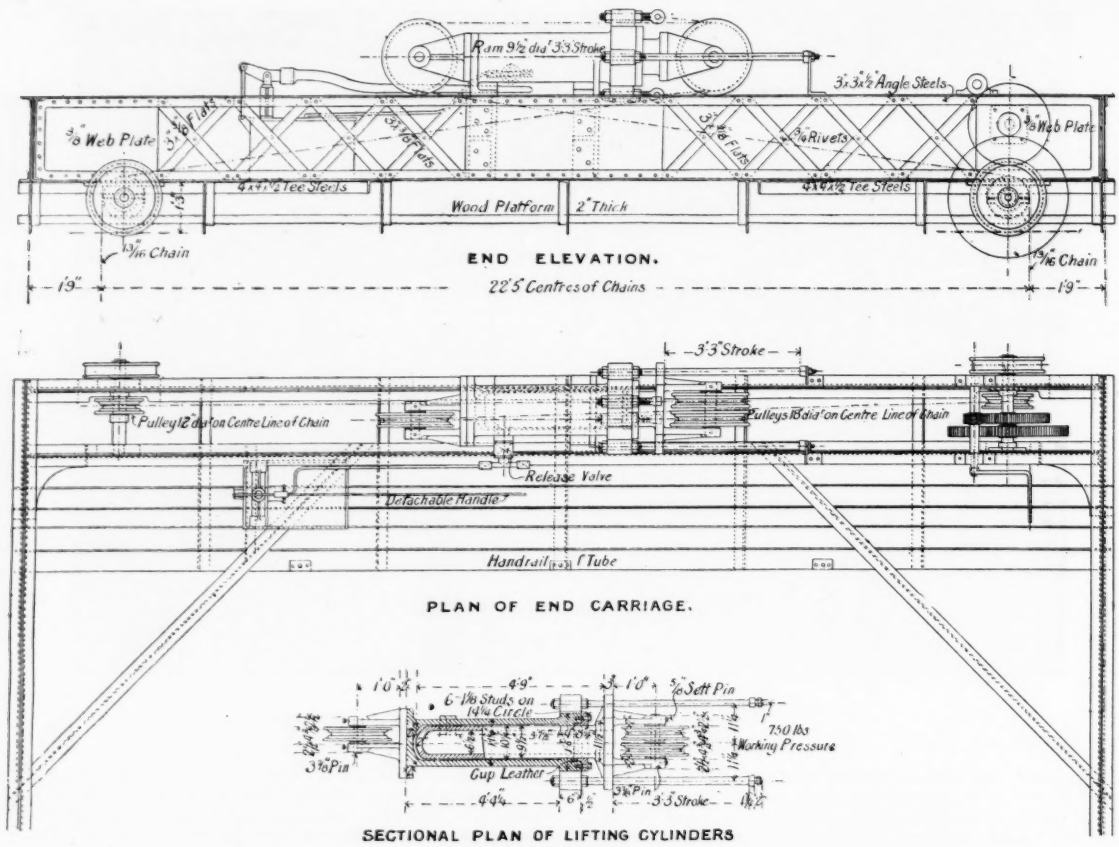
PHOTOGRAPH No. 112.—The purifier covers.

bearer standards are also seen, with provision therein for fixing T-headed bolts for securing the standards to the bottoms. Photograph No. 109 illustrates the purifier-tanks in process of erection, with the side plates attached. Photograph No. 110 shows a set of the boxes almost completed—taken in a direct line with the edge of the water-lute, which it will be seen is of a very wavy character and which resulted in considerable trouble in connection with the fixing of the holding-down arrangements for the covers. Photograph No. 111 illustrates the sieve-bearer and the cross tie-rods staying the sides of the boxes.

Plate No. 22 also shows the purifier-covers; as also Photograph No. 112. These are waggon-ended in form; the side consisting of $\frac{1}{4}$-inch plate, stiffened at the bottom by means of a 5-inch by $2\frac{1}{2}$-inch by $\frac{3}{8}$-inch channel steel—the plates being butt-jointed and double riveted by means of a cover strap with $\frac{1}{2}$-inch diameter rivets, $1\frac{3}{4}$ inches pitch.

The four corners of the boxes consist of 5 inch by 5 inch by $\frac{1}{2}$ inch angle steels, secured to the inside of the $\frac{1}{4}$-inch plates and to the channel steel curb. The top curb of the side plates consists of a 5 inch by 4 inch by $\frac{3}{8}$ inch angle steel. The ends of the covers are stiffened by means of an angle steel continued in a line with the side curb; the latter, at the ends of each box, being carried over to the radius of the cover-crown, which has a rise of 1 ft. 6 in. at the centre. Between this angle and the first T steel curved rafter, 5 inch by $2\frac{1}{2}$ inch by $\frac{1}{2}$ inch steel angle-struts are inserted, three at the end of each cover. The end is also further stiffened by means of three external T steels, of 5 inch by $2\frac{1}{2}$ inch by $\frac{1}{2}$ inch section, riveted to the top and bottom curb, and by means of $\frac{3}{4}$-inch diameter rivets, 6 inches pitch, to the end plates of the cover—see Photograph No. 113. The covers are lifted by four eyes, two on each side of each cover; the lift being directly vertical over the lifting eyes, which are placed 11 feet on each side of the centre of the cover—in fact, in such a position as to exactly balance the weight on each half of the cover longitudinally. The crown of the cover consists of steel sheeting No. 12 B.W.G., riveted with $\frac{1}{4}$-inch rivets, 1 inch pitch,

PHOTOGRAPH No. 113.—The hydraulic apparatus for raising and lowering the purifier covers.



DETAILS OF THE HYDRAULIC TRAVERSING APPARATUS FOR THE PURIFIER COVERS.

and secured to the angle curb by means of ½-inch rivets, 1¾ inches pitch. The sheeting is supported by means of seven curved steel rafters of 4 inch by 5 inch by ½ inch T steels, trussed by means of a ⅞-inch diameter truss-rod stretching from side to side, and 1⅛ inch diameter struts and two girder trusses as described below.

Longitudinally, there are five lines of T steel 3 inch by 3 inch by ⅜ inch purlins, secured to the web of the rafters by means of 2½ inch by ⅜ inch ear plates, 12 inches long, riveted to the purlins by ¾-inch diameter rivets, and to the web of the rafter by means of ¾-inch diameter bolts.

In place of two of the trussed rafters immediately adjoining the lifting eyes, a girder truss consisting of a top and bottom, 5 inch by 4 inch by ½ inch T steel constructed in the form of a bow-string girder, with four T steel struts and diagonal bracing, was interposed; the ends being secured by means of a ⅜-inch plate and by means of angle cleats to the side curb of the cover. The crown trussing of the covers is also secured longitudinally from end to end by means of tie-rods, ⅞ inch diameter, secured to angle cleats on the end of the covers.

The lifting gear (Photograph No. 113) consists of a traversing carriage, on either side of which is mounted a hydraulic cylinder and ram, with sheave blocks and chains extending over guide-pulleys on the axles of the traverser, and descending vertically immediately over the lifting eyes on the sides of the purifier-covers. The traverser is supported upon rails and joists resting upon brackets on the columns of the building—the span from centre to centre of rail being 32 ft. 6 in. The cover, when lifted clear of the lute, and sufficiently high to clear the neighbouring cover, is traversed over the adjoining box and lowered upon wood blocks; the traversing of the carriage and cover—27 tons in all—being performed by manual labour, as hereafter described.

The accompanying engraving shows some of the details of this traversing gear. Longitudinally on either side, a double latticed girder (with an internal web of 18 inches) is constructed, the ends of which are coupled across the breadth of the box by means of a single latticed girder riveted and securely bracketed to it. Beneath the double latticed girders cast-iron pedestal blocks are secured, brass bushed, with spindles inserted therein, and projecting a matter of 7 inches beyond the side frame. On the end of each spindle a 20-inch diameter grooved pulley is keyed; the pulleys forming the traversing gear running upon the rail resting upon the longitudinal joists. The traversing spindle also has a grooved chain-pulley running loosely on the same spindle, so as to guide the chain from the horizontal line to the vertical line over the boxes. To secure the rigidity of the frame, it is securely braced diagonally at each corner by means of 4 inch by 4 inch by ½ inch T steels. Mounted upon the upper flanges of the double girders, a hydraulic cylinder and ram are secured, having a fast pulley on the solid end of the cylinder, and sheave blocks on the traversing end. This end is guided in its passage in and out of the cylinder by running in grooves provided in the cross-head of the ram by means of 2-inch circular guide-rods. The ram is 9½ inches diameter, and the working pressure 750 lbs.

Arrangements have been made for actuating these rams direct by means of the works' hydraulic system. The traverser is, however, in addition, fitted with a hand pump and service tank for working by hand and rendering the apparatus independent of the general system. A platform on the inner side of the compound girders is provided on either side, from which the manipulation of the apparatus is controlled, and also the traversing gear worked. This consists of a compound winch motion, actuating a spur wheel on the spindle of one of the traversing wheels on either side, and is proportioned in such a way as to enable four men on either side to traverse the cover from over the box. Power could have been applied for this purpose; but—seeing that the gang of men engaged in the discharging and refilling of the purifiers are on the spot, and would be simply looking on during the operation of raising and traversing the cover—it was deemed to be equally economical and satisfactory to employ them in the operation.

Electricity Supply Undertakings in London.—The Statistical Office of the London County Council (Mr. Edgar Harper) a short time ago prepared an analysis of the accounts for the year ending Dec. 31, 1901, and March 31, 1902, of the electric supply undertakings established in the County of London by Local Authorities and Companies under the provisions of the Electric Lighting Acts, 1882 and 1888, together with miscellaneous statistics relating to the area of supply, capacity, output, charges, &c., in respect of each undertaking; and at the meeting of the Council last Tuesday authority was given for it to be placed on sale. This has since been done. The tabulated statistics are preceded by a short explanatory memorandum by Mr. Harper.

The Transactions of the Incorporated Institution of Gas Engineers.—We have received the last of the series of volumes in which have been recorded the proceedings of the now dissolved Institution of Gas Engineers. It contains the papers read at the annual meeting held in London in the spring of last year, under the presidency of Mr. Thomas Holgate, M.Inst.C.E., F.C.S., with the discussions thereon, and short accounts of the visits to Cambridge and Halifax. The papers are, as usual, illustrated by many plates. Following the technical matter is a report of the proceedings at the special general meetings in November, at which the amalgamation of the Institution with the Gas Institute was sanctioned; and an appendix contains abstracts of papers published in various chemical journals, &c.

THE PRESENT AND FUTURE OF THE HASTINGS GAS-WORKS.

[Second Article.]

The New Site.

With a fairly intimate knowledge of Hastings and the district, we may venture the opinion that it would be difficult to find a site more suitable for the new gas-works than that which Mr. Botley selected at Glyne Gap, and which selection was endorsed by his Board and, as said last week, by Parliament in the session of 1899. In its relation to the district to be supplied from it, the site is all that could be desired; but from the engineering point of view, it is not perhaps an altogether ideal one. Its contour is varied; and the level of the ground in relation to the line of the London, Brighton, and South Coast Railway, which borders it on one side, presented some amount of difficulty. But it is in the subjugation of radical inconveniences and difficulties of this kind, that the engineer in any work finds his scope; and then the recital of the manner in which the difficulties are overcome enhances the value of a general description of the works in the eyes of a fellow engineer. It is in this connection, as will be seen as progress is made, that much of interest is found at Glyne Gap.

However, the site was formerly purely agricultural land; and it is nearly 3 miles distant from the St. Leonard's end of Hastings, and about 1 mile from Bexhill. In both directions, building is extending; but it is yet, except isolated instances, some little distance from Glyne Gap. The Company were very wise to accept their adviser's counsel—even apart from the pressure felt by their hemmed-in position at Hastings—to get possession of this land well before the house builder in such a popular locality began his ground-absorbing operations. The site is some 20 acres in extent (on upwards of 14 acres of which manufacturing operations can be conducted), and within about 100 yards of the sea. It is bounded on the south side by the railway, on the east by the Hastings Road; on the north by the De la Warr Road; and on the west by what is at present but agricultural land, used as golf links. A road will eventually be laid out here, and the land developed for building. The gradients of the works site practically fall north to south. But there is a rise to the west end; and this Mr. Botley is making use of to bring in the low-level railway. In addition to the varied levels of the ground, there were two main primary difficulties which had to be dealt with before definitely proceeding with the plans for the works proper, as on the solution of the former the latter to some degree depended. The first was that the railway is not quite so high as the Engineer would have liked it to be, in order to enable him to run the trucks by an overhead line direct into the coal-stores. The second trouble was that, the railway being at a curve at this particular point, made it difficult to get the sidings lineable. A third trouble to be faced was that the land being below the lowest point of the Bexhill sewerage system, Mr. Botley had to make special arrangements for raising the sewage to discharge it into that system.

Railway Retaining Wall and Sidings.

We will at once give an account of the methods adopted in dealing with these primary difficulties, as to an extent they fixed the course of subsequent operations. Before work was commenced, the railway embankment was what one might call a

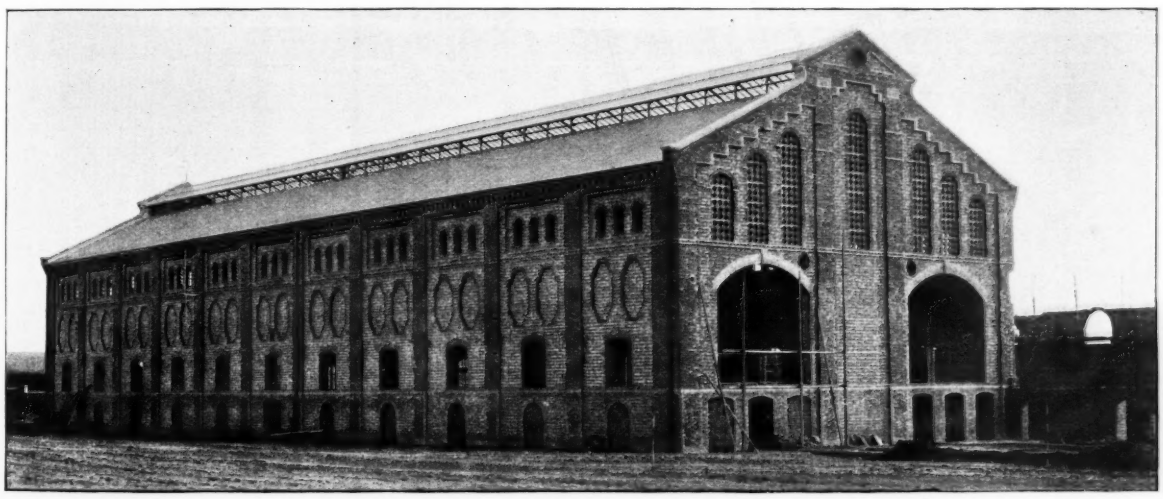


Fig. 1.—Exterior of No. 1 Retort-House, Showing Large End Openings for the Passage of the Charging and Drawing Machinery from House to House.

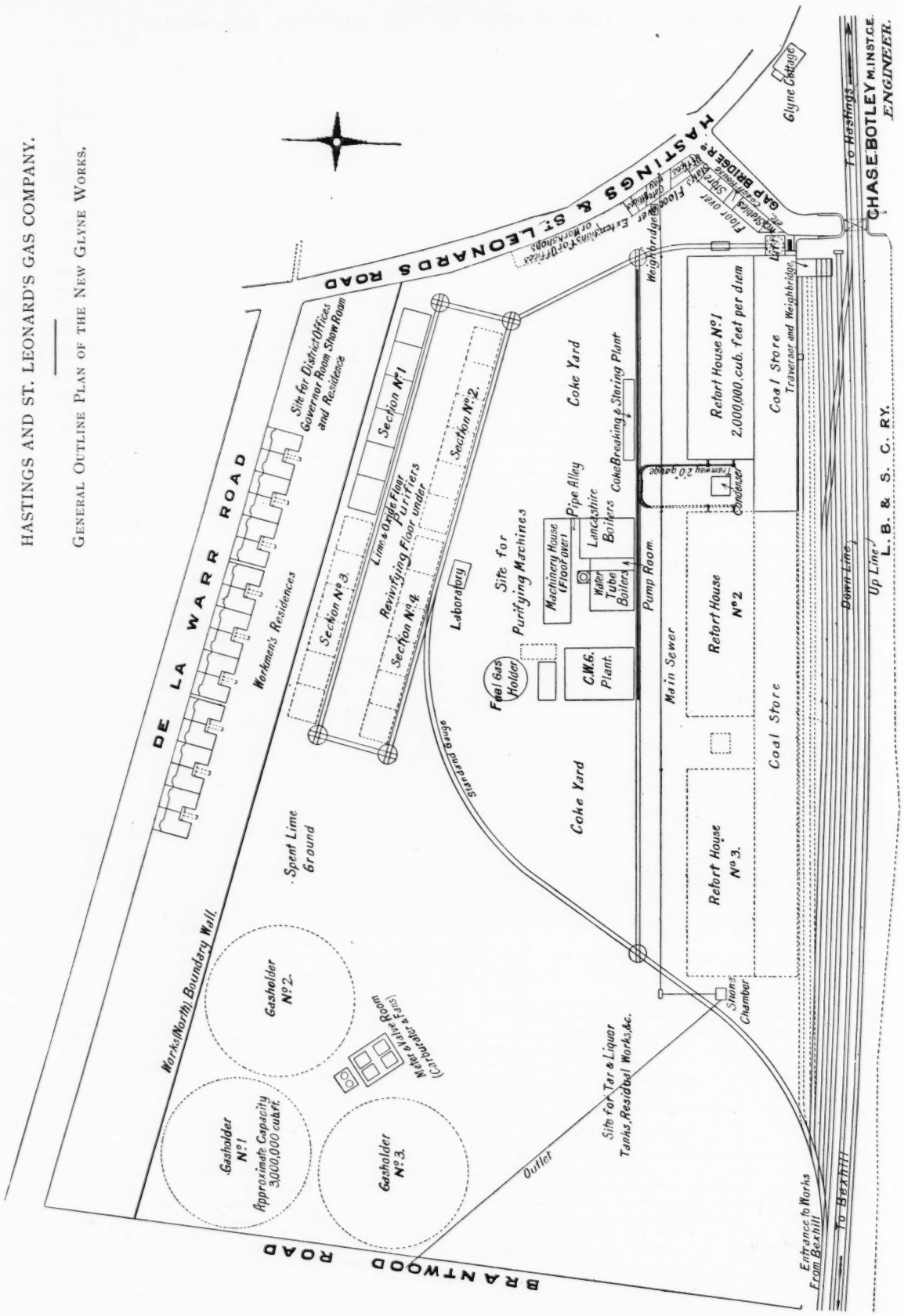
heavy slope right back to the main line; and at the south-east corner of the site, water stood practically the whole year. It dried up in seasons of drought; but at other times water (principally surface water) was always to be found there. It was necessary to start work in that corner, and to bring the level up, by about 5 feet, to the ordinary yard level, which is 17 feet above Ordnance datum. In conjunction with this work, it was necessary to proceed with the retaining-wall, in order first to provide a tip for the spoil from the yard levelling as well as the retort-house excavations, &c., and secondly to provide early siding accommodation for the material to be used in the building work. This siding accommodation is therefore all reclaimed ground; and the space filled in is of wedge shape, about 56 feet wide at the top, and coming down to a base of about 20 feet or thereabouts. Altogether something like 50,000 cubic yards of soil have been required for the filling up. In addition to the building of the retaining-wall, the abutment of Glyne Gap bridge (fig. 2) had to be considerably widened.

While the erection of the retaining-wall was in hand, a thorough survey was made of the levels—every chain square being taken—so that the Engineer had from the start an accurate record. During the building of the wall, levelling up was also going on, in order that, as soon as possible, the high-level sidings could be laid down. These were put in (by arrangement) by the Brighton Railway Company themselves. Incidentally it may be stated that the arrangement is a very satisfactory one; and the Gas Company will have four roads of railway sidings on the high level, or practically a mile of siding accommodation, with provision for the Railway Company, without any inconvenience to the Gas Company at all, widening their main line, if at any time they wish to do so. This, of course, is a great consideration. Pursuant to agreement, all this levelling work for the sidings and the retaining-wall had to be subject to the approval of the Railway Company's Engineer (Mr. C. L. Morgan); and, it need hardly be said, that Mr. Botley's carefully laid plans met with his entire approval. The retaining-wall is a solid piece of work. It has a concrete foundation varying from 7 ft. 6 in. to 7 ft. 3 in. wide, and from 8 to 10 feet deep. In one or two places, the foundations are carried deeper than the main purpose really necessitated, in order to form the sides of water-tanks below the coal-stores which will run longitudinally with it, as hereafter described. In connection with the foundations, it may be incidentally mentioned that only one bad place has been found, and that was by the bridge at the extreme south-west corner, but it has lately given no trouble. At that point, in fact, there is no superimposed weight on the wall; because, although the lift-house, as seen in the plan, is in proximity, the structure is quite independent, and the corner of the coal-store is some 24 feet farther west.

The retaining-wall is practically vertical on the back side; and it is faced with blue bricks throughout on the coal-store side. It is built four courses per foot throughout; and, being a brick and concrete structure, every fourth course has turned headers into the work. The wall batters 1 in 6 on the coal-store side, and is made of just sufficient width at the top to carry the side wall of the coal-stores. It is also relieved by 14-inch piers on the inner face, at 21 feet centres, to carry the top piers which support the overhead railway. These piers are seen distinctly in fig. 3. The top of the retaining-wall is brought up to about 2 feet of the main railway line level; and it varies in height above the concrete foundation (which is practically a horizontal line throughout) from 14 to 15 feet. The length of the retaining-wall is built in three sections. The retaining-wall proper from the bridge corner is about 900 feet long; and then there is a reduced retaining-wall

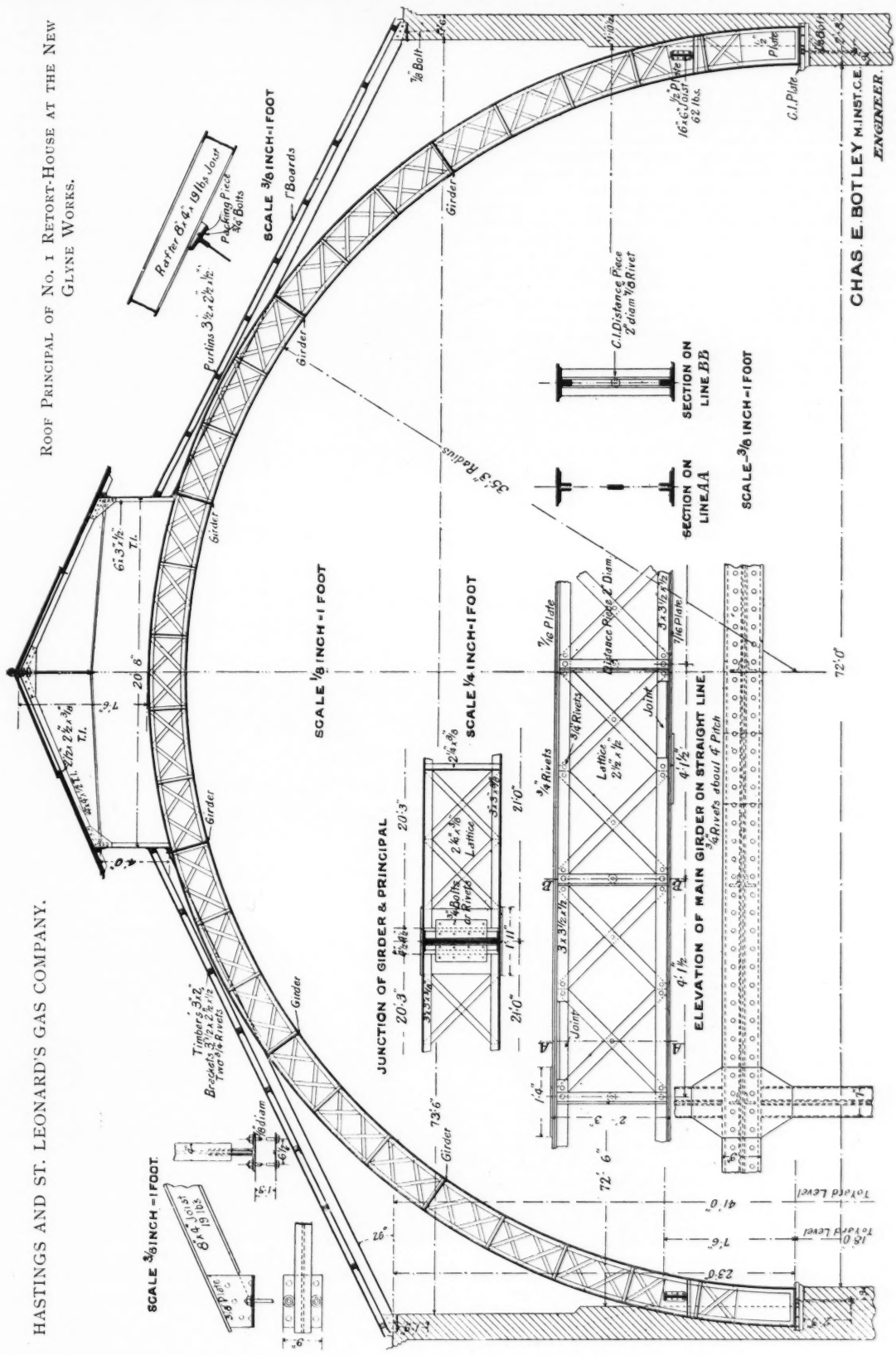
HASTINGS AND ST. LEONARD'S GAS COMPANY.

GENERAL OUTLINE PLAN OF THE NEW GLYNE WORKS.



at the west end 150 feet long. This has not to carry the burden that will be imposed on the retaining-wall proper; but it intersects on the face, and makes a uniform job throughout. It is a compact and sound piece of work, of which the Engineers are justly proud.

There are a few other points about the construction of this retaining-wall which may be of some interest to engineers. It is built of beach concrete, and the proportions were about 6 to 1—cement from Newhaven being used. The specification required a tensile strength, after seven days' setting, of 400 lbs. per square inch, with the other usual conditions as to residue, &c. The beach (which was taken from the foreshore immediately south of the site) was to a large extent bought beforehand on very favourable terms. It was stored in position close handy to the work,



so that the concrete was produced, as regards its cost, under exceedingly advantageous conditions. In the work, little trams were employed of such capacity that ordinary gauging-boxes were avoided, because a tram load tipped on to the concrete stages was exactly the right quantity to take two bags of cement. These are small points perhaps; but they are interesting. It is, in fact, small points of this kind that promote tremendous savings in a big job. The parliamentary estimate for building this retaining-wall was £5000; and it has been carried out direct by the Company considerably under this cost. Several circumstances contributed to this. There was the advantage of being able to work one job in with another; there were no contingencies to provide for, as would have been the case if the work had been let to a contractor; and moreover the conditions were such that the work was executed with a minimum of plant. In proper place, a description will be given of the methods adopted for dealing, from the

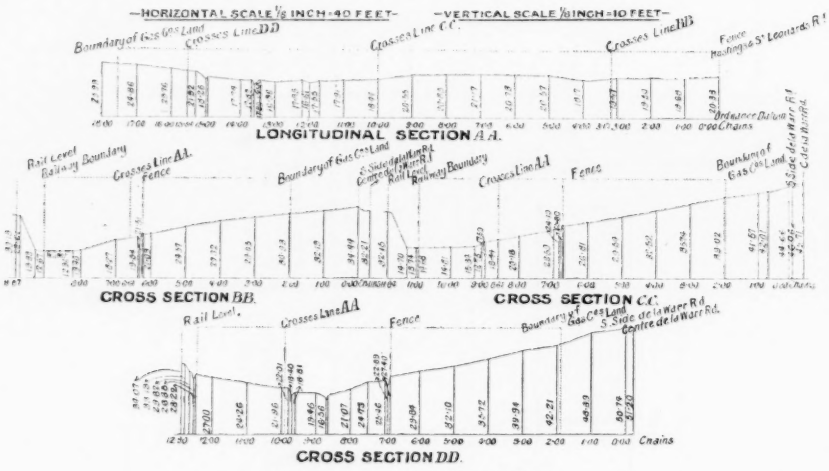
railway sidings, with the ingress and egress of the trucks to and from the works.

Drainage and Sewerage.

As already mentioned, while the retaining-wall was being built, the levelling of the portion of the site on which the main buildings were to stand was being pushed forward, and, of course, simultaneously the spoil was being used for filling in between the retaining-wall and the railway lines, to make up the ground to the requisite height for the sidings. The drainage work was also proceeding at the same time; and a complete system of sewerage was laid on the most modern lines. There has already been a reference to the necessity for adopting some means of raising the sewage, in order to discharge it into the Bexhill sewerage system. The Shone method of doing this found favour; one reason being that with this compressed air is used, and as compressed-air plant will, as will be observed later, be installed on the works, the necessary supply for working the Shone system will cost less than if special plant had to be put down. The Shone chamber is located in an isolated position, at the extreme west end of the site for No. 3 retort-house. It will be built of glazed bricks; and provision as in all other cases is made for enlargement. The outlet is an 8-inch flange pipe, which delivers into the Bexhill system. The ejectors (which are automatic) will, in the first instance, be equal to 100 gallons a minute. They are, of course, in duplicate. In addition, it will probably be necessary to sink a well, with some special powerful pumping plant to deal with emergency surface water, until such a time as the neighbourhood is developed. This plant will most likely be driven electrically.

Retort-House No. 1.

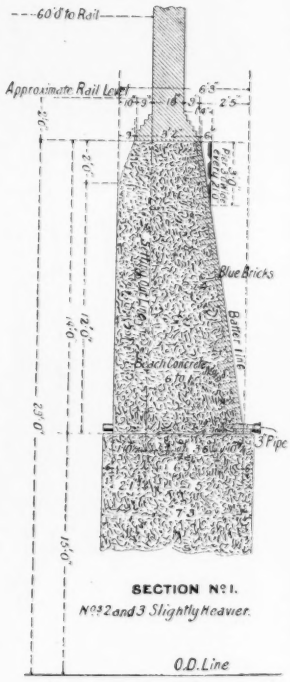
The next step in the work was the making of the foundations for No. 1 retort-house. It should be explained here that this house forms the first of three contemplated by the scheme; and these will run (lengthwise) parallel with the retaining-wall to the railway sidings—the intervening space, as will already have been gathered, being occupied by the coal-stores. The three houses will have a total productive capacity of 6 million cubic feet, or 2 millions each. This little interpolation will render assistance in understanding the lines of the plans adopted by the Engineer. The foundations for the house already constructed (the side wall of which facing the retaining-wall also serves for the coal-store) required about 1000 cubic yards of material. The mid-wall, of course, had to be carried deeper than would otherwise have been necessary, in order to provide one of the walls for the water-tanks under the coal-store, to which subsequent allusion will be made.



Sections of the Glyne Site.

The first section of the brickwork of the building was started in 1901, and in May of last year the finishing of the house itself was taken in hand. So far as the brickwork was concerned, the whole of the material was supplied by the Company; the provision of the labour and scaffolding required being the only subjects of contract. No special bricks of any kind were used; the work generally being composed of wire-cut bricks, with red-brick facings for the piers, blue bricks at the ground-line, and bull-nosed bricks to all corners. The length of the house (which is designed to allow of sufficient carbonizing plant to make at least 2 million cubic feet of gas per day) is at the yard-line 231 feet, and its width is 70 ft. 1½ in. Both the length and width, however, are increased at the stage-floor line, owing to the setting-back of the brickwork from the inside all the way round. The objects of this were to reduce the thickness of the brickwork, and save the cutting of bricks; and also to provide a lodgment for the girders of the stage-floor. The upper part of the brickwork is simply a skeleton; and it can be seen that, in the top side panels, it is only 9 inches thick. In designing the work, great attention was paid to the saving and cutting of the brickwork; and an economical and thoroughly good structure is the result. In the west-end wall of the house facing the vacant site of the second and third retort-houses, two large arched openings (see Photograph No. 1) have been made, of sufficient dimensions to allow of (should, when the time arrives for their erection, it be decided to equip Nos. 2 and 3 houses with horizontal retorts) the passing of the charging and drawing machines from one house to the others as occasion requires; the idea being to so arrange the carbonizing operations that the maximum amount of work shall be obtained from the machinery. In fact, it may unhesitatingly be said, from the study of the plans, that the prospective economy which will accrue in several directions through the foresight of the Engineer will be greater than that which will be realized immediately after the works are fairly started. In other words, as the scheme is developed, so will be the economy. One other point may be mentioned in this connection. Ventilation, light and plenty of operating room are features that have received liberal consideration; the summer climatic conditions of the district rendering the first and third of these features absolutely indispensable for the comfort of the workmen. In the old works, Mr. Botley has had his men and operations so "cribbed, cabin'd, and confined," and has been so hard pressed by the disadvantages, that elbow-room and breathing-space have been given a prominent place in his plans as essentials to good working.

While noting the particulars of the brickwork, the foundation-stone was observed in the centre of the wall at the east end of the house. The inscription will transmit to those who come hereafter the names of the men who were directing the fortunes of the Company at this important period of its history. It reads:



Section of Railway Retaining-Wall.

> **Hastings & St. Leonards Gas Company.**
>
> *Incorporated 17c. Victoria, Cap. VI.*, 1854.
>
> GLYNE GAP WORKS, No. 1 SECTION.
>
> *Directors:*
>
> George G. Gray, LL.D., J.P., Chairman, Major Stanley T. Weston, J.P., Dep. Ch.
>
> Charles E. Beeching, J.P., William Stubbs, J.P.
>
> John Henry Cook,* Albert Parks, George W. Veness.
>
> *Secretary:* A. E. Young. *Accountant:* James T. Piper.
>
> *Engineer & Manager:* Chas. E. Botley, M.Inst.C.E. } *Engineers.*
> *Assistant Engineer:* C. F. Botley, Assoc.M.Inst.C.E. }
>
> *This Stone was laid by the Chairman, Oct. 24, 1901.*
>
> [* Since deceased.]

Directly the retort-house is entered, the eye is attracted to the roof; and a single glance is sufficient to convince that it has also had some very special attention bestowed upon it. It is light and pleasing, has been much admired, and among retort-house roofs we believe that to-day, taking it as a whole, it stands unique. The roof is of the lattice-girder type; and it has been so constructed as to provide the necessary elevation, should it be desired at any time to instal inclined retorts. This, it may be

incidentally remarked, points to the possession of an unprejudiced mind on the subject on the part of the Engineer. Before coming to a final determination as to the form of the first equipment of the house, he and his Chief Assistant gave full consideration to the claims of the inclined system; but the difficulty they had in arriving at the whole truth as to the capabilities, actual and potential, of the system in comparison with horizontal retorts worked by power machinery, and in view of their particular circumstances which would not admit of risk, it was decided, so far at all events as the first section was concerned, to instal horizontal retorts and stoking machinery. This is a little digression suggested by the roof, upon which we have now more to say.

The building measures in plan at the roof-line 73 ft. 6 in. wide, and 233 ft. 7½ in. long. The height from the floor-line to the underside of the girders at the centre is 53 ft. 3 in. The normal span of the house is 72 ft.; but the span of the principals is 70 ft. 6 in., as the piers carrying these project 9 inches each side into the retort-house. The principals are secured to cast-iron anchor-plates, which form a cap to the top of the piers, and they also run partly into the side walls of the building. They are uniform throughout. The weight of the ironwork in the roof is approxi-

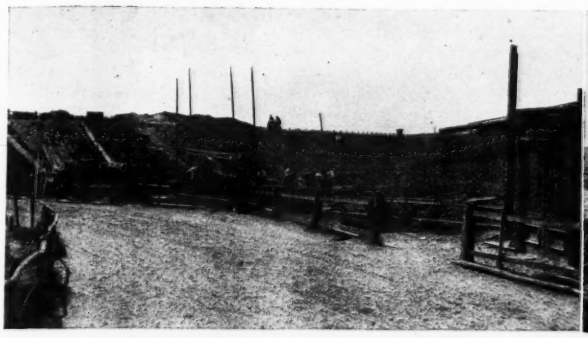


Fig. 2.—Glyne Bridge, where the Retaining Wall Work for the Railway Sidings Commenced.

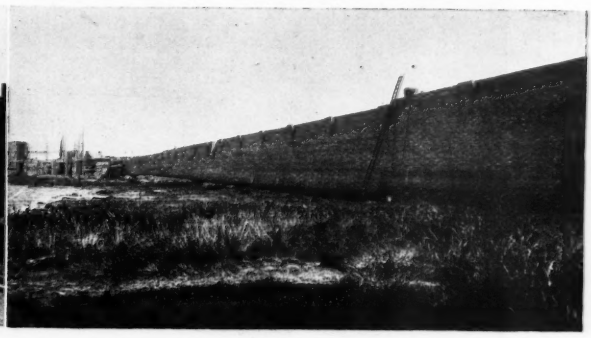


Fig. 3.—A Long-Distance View of Part of the Railway Sidings Retaining Wall.

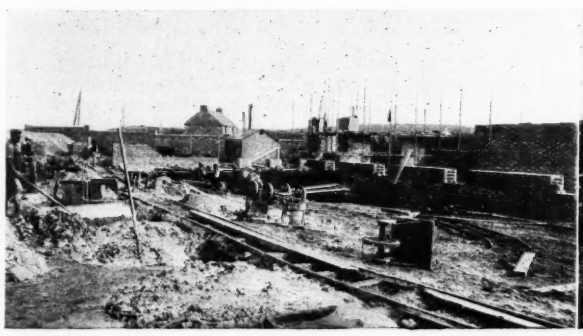


Fig. 4.—One Corner of the Site at the Early Stages of the Work.

Fig. 5.—West End and South Walls of No. 1 Retort-House in Progress.

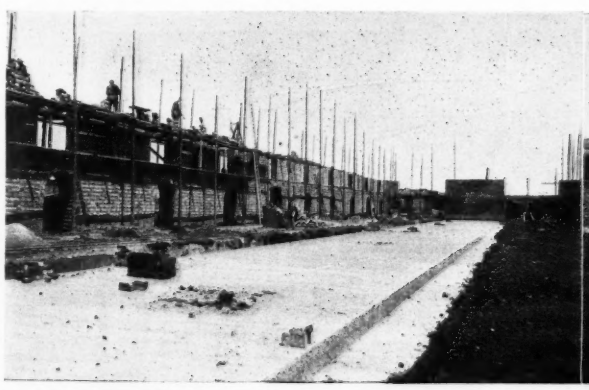


Fig. 6.—A View Inside No. 1 Retort-House During Erection, Showing Concrete Bed for Retort-Stacks.

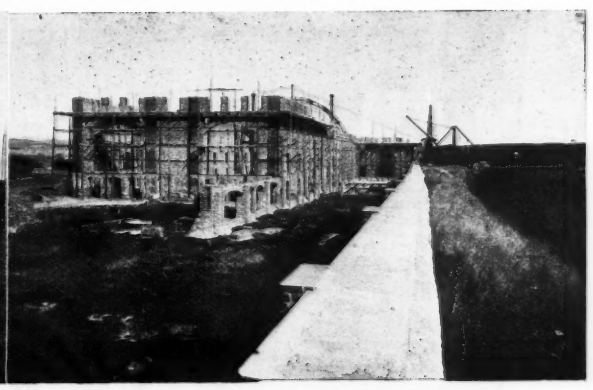


Fig. 7.—View taken from Railway Retaining Wall, Showing Retort-House, with Lift-House in Distance.

mately 160 tons. The end bays involved special girders as regards length. Otherwise, there was no complication; the whole structure came together perfectly, without blind-holes or anything of the sort, and the joists forming the rafters were lineable from end to end. As previously stated, the upper part of the brickwork of the building is simply a skeleton; and it is a convenient place to mention that the rafters have shoes on them which keep them in position and hold the brickwork secure. For the same reason, the girders in the end bays are secured to the gable ends.

This general indication as to the ironwork in the roof, it may be both interesting and useful to supplement by a more extended description. The principals divide the house into eleven bays—nine being 21 feet centres, and two (at either end) 22 ft. 3¾ in. from centres to the inside of the gable end walls. The base or anchor plates are of cast iron; and, as mentioned, these rest partly on the main brickwork and partly on the 3 ft. by 9 in. piers. The cornice of the bases projects 1 inch below the top of the pier, to which it forms a cap. The underside of the bases is hollow, with ribs across to allow for being grouted up solid with cement after fixing. To these plates the principals are screwed up by 1-inch bolts in the T-piece. The holding-down bolts are 1⅛ inches diameter, and 3 ft. 4 in. long over all; and the 12 in. by 3 in. by ⅜ in. plates for them project into the main brickwork.

The principals (which are constructed of mild steel throughout) are of the lattice girder type, 2 ft. 3 in. deep, 9 inches wide, and

FIG. 8.—INTERIOR OF RETORT-HOUSE BEFORE COMPLETION OF ROOF.

semi-circular; the inner radius, 35 ft. 3 in. The top and bottom flange plates are $\frac{7}{16}$ inch thick; the angles $3\frac{1}{2}$ in. by 3 in. by $\frac{1}{2}$ in.; and the lattice bars $2\frac{1}{2}$ in. by $\frac{1}{2}$ in. There are cross stiffeners of $2\frac{1}{2}$ in. by $2\frac{1}{2}$ in. by $\frac{1}{2}$ in. angles about every 4 ft. $1\frac{1}{2}$ in. apart. These are quite straight, butting the top and bottom angles, and riveted at centre with $\frac{7}{8}$-inch rivets, and a 2-inch cast-iron ferrule between. The general riveting is $\frac{3}{4}$ inch to $4\frac{1}{8}$ inch pitch; but $\frac{7}{8}$-inch rivets are used for the joints, stiffeners, &c. For the attachment of the longitudinal girders, the only provision in the principal is the drilling of four $\frac{3}{4}$-inch holes in the stiffeners at the required points. The ends of the principals have $\frac{1}{2}$-inch web plates, and framed angles with square corners. A base plate 9 in. by 2 ft. 3 in. is riveted to the angle-frames; and slotted holes allowed some margin in the span of the principal. Six bolts secure the principal to the anchor-plate.

Regarding the girder work. In each of the eleven bays, there are six lattice girders and two steel joists. The former are constructed in one length, 20 ft. 3 in. long over all, except in the outer bays. There they are 22 ft. 6 in. long. The flanges are 7 in. by $\frac{3}{8}$ in.; the angles 3 in. by 3 in. by $\frac{3}{8}$ in.; the lattice bars $2\frac{1}{4}$ in. by $\frac{3}{8}$ in.; the web plates $\frac{3}{8}$ in.; and the cross stiffeners $2\frac{1}{2}$ in. by $2\frac{1}{2}$ in. by $\frac{3}{8}$ in. angles. The riveting is $\frac{3}{4}$ in. to 4 in. pitch. The end bay girders where they are built into the gable end walls are furnished with angles, to which is connected a 1-inch bolt passing through the wall, and furnished with a cast-iron wall plate, about 8 inches diameter. The lattice girders form the main purlins at several points, and are connected to the principals by $\frac{1}{2}$-inch junction plates top and bottom, and $\frac{3}{8}$-inch joint plates. The joint plates connect the end plate of the girders to the angle stiffeners of the principal, and have riveted to them a butt-piece about $1\frac{1}{2}$ inches wide. The two steel joist girders—16 in. by 6 in. by 62 lbs.—are 20 ft. $11\frac{1}{2}$ in. long for all the bays, except the end ones, where they run into the walls like the others; and in this case, they are also 22 ft. 6 in. in length. In the principals, a solid web plate is inserted to suit these girders, which are secured by 3 in. by 3 in. by $\frac{1}{2}$ in. angles, and $\frac{3}{4}$-inch rivets or bolts at the bottom and the sides of the web.

As to the rafters or secondary roof. The angle of the rafters

FIG. 9.—INTERIOR OF RETORT-HOUSE DURING ERECTION OF THE BENCHES.
(Rendle's Glazing in Roof will be Remarked.)

is 26°, and the line about 1 inch above the clearing line of the principal. There are two lines of rafters in each bay, except the centre, where, in order to secure symmetrical arrangement, they are omitted. The centres are 10 ft. 6 in., except the middle bay. The rafters start from the side walls, where they are fitted with shoes, and fastened by two $\frac{7}{8}$-inch bolts, and rest midway on one of the lattice girders, to which they are attached by means of packing-pieces and $\frac{3}{4}$-inch bolts. Beyond, the rafters extend, and are riveted to the 6 in. by 3 in. by $\frac{1}{2}$ in. angle along the louvre. They are of 8 in. by 4 in. by 19 lbs. steel joists throughout. On these rafters, brackets of $3\frac{1}{2}$ in. by $2\frac{1}{2}$ in. by $\frac{1}{2}$ in. angles are riveted at about 3 ft. 9 in. centres to suit the purlins. These (which consist of $3\frac{1}{2}$ in. by $2\frac{1}{2}$ in. by $\frac{1}{2}$ in. angles throughout) are not attached directly to the principals. At each end, they run 3 or 4 inches into the walls; and, the roof being boarded, they are made up with 3 in. by 2 in. quartering properly shaped to rest solidly and complete the rectangle.

The louvre adopted is, so far as we know, unique for retort-houses; and it has been put in by Mr. Botley somewhat as an experiment. It is covered with Rendle's glazing, similar to that used at railway stations. It is hoped that the upcast induced by the centre heated currents will be maintained at a sufficient velocity, and the smoke so adulterated, as to prevent the glass from becoming very dirty. So far it has been exposed to dirt, sun, and rough weather, and has proved perfectly satisfactory. The height from the floor-line to the ridge of the louvre is 62 feet; the louvre itself is 20 ft. 8 in. wide out to out. The details of the ironwork of the louvre may also be of interest and use. There is a principal every 7 ft., except in the end bays, which are wider. The verticals are of 6 in. by 3 in. by $\frac{1}{2}$ in. steel tees, resting on the lattice girder at the bottom, and riveted to it by four $\frac{3}{4}$ in. or $\frac{7}{8}$ in. rivets, and $3\frac{1}{2}$ in. by $3\frac{1}{2}$ in. by $\frac{1}{2}$ in. angles. At the line of the roof, and acting as a purlin, a 6 in. by 3 in. by $\frac{1}{2}$ in. continuous angle is riveted to the verticals, and similarly at the top of same a 3 in. by 3 in. by $\frac{1}{2}$ in. continuous angle carries the woodplate. At each pair of verticals, which are about 20 ft. 4 in. out to out, the louvre roof is carried by an ordinary truss. The rafters are 4 in. by 4 in. tees, with strongly riveted double $\frac{5}{16}$ in. plates at the ridge end and eaves. The tie-rods are 1 inch diameter, with flat ends, and 1-inch bolts to the corner plates; and $\frac{5}{8}$-inch tension rods raise the tie-rods 6 in. or so above the horizontal line. To carry the wood purlins, 4 in. by 4 in. tees are connected to the rafters with riveted bracket pieces; and to carry the ridge board there is a 6 in. by 4 in. by $\frac{1}{2}$ in. T attached to the rafters. It will be remarked that the whole of the roof has been designed with ordinary sections of iron, so that its construction came out at a very reasonable figure.

A brief reference to the covering will complete the description of the roof. Owing to the contiguity of the house to the sea-shore, it was necessary to consider some better means than the ordinary for fixing the slates; and the plan adopted has been this: The roof (which is at an inclination of about 26°) is close boarded. The boards (which were pickled with two coats of tar oil applied hot) are screwed to the quartering with which the purlins of the roof proper are filled. Then the slates—Bangor, 22 in. by 12 in.—are fixed on close with copper nails, which are, of course, protected by the pickled wood. In this way, the wind has no chance of playing on the undersides of the slates. It is hoped that this method of dealing with the roofing will effectually accomplish what is aimed at, and that is the avoidance of such trouble as has been experienced at the present works, although they are situated farther from the sea-shore than the new ones. This portion of the work was carried out by the Company themselves, with a sub-contractor for the slating, as no satisfactory tender was obtained for the complete job. The Engineer's estimate for this part of the work was £475; and it is satisfactory to note that the actual cost (including an allowance for the use of scaffolding, &c.) was £438 7s. 2d.—a price which was not touched by the contractors who previously tendered. Speaking of estimates, it may be mentioned, too, that the Engineer's calculation for the complete building was £8000; and it has arrived at a stage of completion when it can be confidently said that the work has been executed well within the forecast.

We have dealt in detail with this roof, because it has rather taken our fancy as being a good model for a house of this character. This view is corroborated by Messrs. Clayton, Son, and Co., Limited, of Leeds, who were the contractors for the ironwork. In his desire to have the work carried out on the best possible lines, and welcoming any hint which might be considered an improvement on his plans, Mr. Botley invited the Contractors' representatives to make any suggestion; and their reply expressed not only their inability to do so, but words of praise regarding the general design. The reader's attention may again be called to Photograph No. 1, which gives a fine representation of the shapely exterior of the roof and louvre.

In the opening of this article, reference was made to the variation in the level of the site. Where the retort-house stands, it may be of interest to know, the level is 17 feet above Ordnance Datum; and then there is a rise of 10 feet to the site which has been prepared for the accommodation of the purifiers.

In the next article, we shall deal with the retort-house equipment, proposed and in hand, and the coal-stores and water-tanks, the completion of which is now being pushed forward.

POINTS OF GASEOUS FIRING.

THE remarks of Mr. Arthur Valon on some of the fundamental points of sound practice in the gaseous firing of retort-settings which appeared in the "JOURNAL" for the 19th ult., are very pertinent to the question of the theoretical advantages of this method of retort-heating. It is very true that, as time goes on, men fall into the habit of taking many things for granted which once struck them as fit subjects for controversy. This has been the case with gas-firing of retort-settings, with and without heat recuperation. Though it is impossible to be continually overhauling one's beliefs, it is none the less desirable that one should never quite forget the bases on which they rest. Mr. Valon has therefore done the gas industry good service by repeating, in a brief and convenient form, the case for regenerative retort-furnaces. The merit of this principle in gas-firing is simply and solely one of fuel economy. Gas-retort furnaces work in practice neither better nor worse for heat recuperation; but there is a certain amount of saving to be realized by it under favourable conditions. Mr. Valon puts the possible theoretical economy at 28 per cent. of the total fuel used in the furnace. This figure we should be disposed to think full high, if it refers to the total heat-carrying capacity of the secondary air. If it refers to the theoretical loss of heat by the waste furnace gases, it is probably near the mark. The question is not a practically important one, especially as Mr. Valon admits that an actual saving of 18 per cent. is the most that can be expected from a "simple" form of recuperator. This is pretty good working.

It may be objected that, in using this gratifying description of the recuperative arrangements he had in mind, Mr. Valon begs the question of what is either possible or expedient in this connection. This is unavoidable, in the circumstances, because in the case of retort-furnaces neither the amount of heat transference to be done, nor the manner of doing it, can be profitably carried beyond a certain point. Retort-furnaces are about the smallest things of their kind that are worked to so high a temperature; and even this is inferior to the temperatures which gas furnaces are otherwise employed to produce. Heat recuperation was not originally introduced for the sake of economizing fuel, but in order to intensify the temperature. It is not practised for this purpose in gas-retort heating; and the difference constitutes the regenerative gas-retort furnace a thing *sui generis*.

Perhaps the most suggestive of Mr. Valon's remarks is that which explains the necessity for long secondary air flues as being due rather to the sluggishness of the heat conduction through the flue walls than to anything arising out of the physical nature of the air itself. It should never be overlooked that the method of heat recuperation practised in connection with gas-retort furnaces differs essentially from that devised by Siemens, and always used for this purpose wherever possible. This consisted in the direct alternating contact of the waste gases and the air with the material of the regenerator. In gas-retort furnace regenerators, the method of heat exchange is by transmission through the walls of fire-brick channels; and this enormously handicaps the operation. As Mr. Valon truly observes, it is practically impossible to measure the effect of this arrangement. The working pyrologist can only feel his way with it, and rest content when he gets some satisfactory evidence that his dispositions are doing something positively good. Nobody can engage in this kind of technical work without realizing that fire-clay vessels are very bad heat conductors.

Exactly how fire-clay (as ordinarily used for retort-settings and furnace construction) stands as a heat conductor, is not known; but there are plenty of indications to show that it is about the most sluggish of all substances that could be used in this way, for working by transmitted heat. Indeed, if it were only a question of heat transmission, fire-clay gas-retorts or crucibles would be impossible. Let a leaden bullet be placed upon a thin fire-tile over a bunsen burner, and the time of melting compared with that of another bullet on a piece of iron. The obvious inference from this test would be that fire-clay is most unsuitable for use in any such way. But it is not wholly a question of heat transmission. The fire-clay gas-retort works chiefly by accumulated heat. Even so, a retort-setting is quickly and easily cooled down. No gas manager needs to be reminded of the astonishingly deteriorating effect upon his heats of wet coal. A quantity of moisture in the charge which an iron retort would make nothing of, will render a clay retort in the hottest furnace black inside. Even small coal will tax the power of the clay retort to retain its heat. The old suggestion of Siemens and others, to pass a current of steam through a gas-retort towards the end of the charge for certain well-known reasons, could not be carried out for this cause.

The heat of a retort-setting is an extremely tender property, and will not bear tampering with. The reason is that fire-clay is a very bad heat conductor. Yet it is largely as a conductor that it is required to carbonize coal—in itself an extremely sluggish substance to heat—and to heat air in the recuperative channels of the setting. It is no wonder that the work is done with difficulty. Though fire-clay acquires heat slowly, and transmits it hardly at all, it appears to part with it readily by surface contact. Hence the brick chequer-work in a Siemens regenerator or a Lowe carburetted water-gas plant becomes extremely hot on

the surface, and imparts this high heat very quickly to the gaseous currents that directly impinge upon it. No transmission regenerator can approach the efficiency of this arrangement, as no retort plant can equal the rapidity of action of the cupola. These are truisms; but they are often overlooked.

From time to time the obstacle of the substance of the gas-retort itself has been attacked with the object of getting rid of this seemingly necessary evil, or at least of diminishing its obstructive power. The most successful of recent attempts of the kind appears—at any rate in France—to be the corrugated retorts of Messrs. Teissier and Nègre, which are extensively used in that country. The Paris Gas Company employ no others. The effect of this modification of the form of retort sections is to increase the heating surface, and to enable the retorts to be made thinner. It may be matter of opinion as to which is the more valuable feature; but it is vouched for that the device produces a distinct gain of gas and saving of fuel. If this is so, the fact points to the disadvantageous character of the usual make of fire-clay retorts. This is a subject that calls for more attention than it has hitherto received; for it is not creditable to the followers of the gas industry that the Teissier-Nègre retort should remain the most advanced article of its class known to technicians. As a carbonizer, the fire-clay retort is no improvement on the iron retort; it is only more refractory—in more than one sense of the term.

Mr. Valon's remarks upon outside gas-producers for supplying the fuel to a range of settings call for some notice. He rightly styles this a "reintroduction," because the idea really preceded the use of separate gas-furnaces to every setting. As he says, the question raised here is a balance of gains and losses. There is nothing else in it. It will be easily seen, however, that an engineer who has to plan and work a retort-house of a dozen or more settings of retorts, all in a row, and all precisely alike, may naturally wonder whether it is absolutely necessary to have as many gas-generators as there are settings. Every producer means a certain amount of individual attention; and it is this multiplication of cares that the manager of many workmen feels to be one of his chief worries. A single generator neglected will spoil the character of the working of the house. Moreover, there arises the question of chimney draught. It is not so easy to make all a numerous battery of producers regulated by a common chimney do their work equally well.

The single outside gas-producer, therefore, in the first place, is a means of lightening the anxieties of the manager. He can at a glance satisfy himself as to its working performance, and easily check the consumption of fuel. The trouble and mess of feeding the separate producers are avoided; and all the best coke can be saved for the market. By means of the simple test applicable to the gas produced, the regular functioning of one generator can be supervised from hour to hour; whereas nobody knows what goes on inside a particular setting's furnace until the retorts betray it. The loss of the single outside producer is, of course, due to the dissipation of the sensible heat of the gas before it reaches the place of its combustion. Mr. Valon puts this loss as high as 40 per cent.; but this is too much. As a matter of fact, the outside generators at the Old Kent Road Gas-Works are expected to work with 10 per cent. of the weight in coke of the coal carbonized. It is difficult to believe that there would be much saving on this if the work were subdivided among a number of small producers. The question of the loss of heat due to the cooling of the gas of producers is a general one, and does not apply to the case of gas-works furnaces alone. It is usually estimated rather than known, and is generally put at from 20 to 30 per cent. of the original weight of fuel. It is therefore a serious matter for users of fuel in this form, even though the loss may not often attain the figure assigned to it by Mr. Valon.

A recent computation of a loss of this kind has been made very carefully by Mr. H. G. Scott, the Engineer of the Ormesby Iron-Works at Middlesbrough, upon blast-furnace gas. His object was to ascertain whether it is worth while to cool and cleanse this gas before using it to fire boilers or heat air-stoves. He calculated that the total loss by cooling from 600° to 60° Fahr. would be 10 per cent. of the whole potentiality of the gas. In order to reheat the gas to its original temperature of 600° Fahr., a further 10 per cent. of heat would have to be applied to this purpose—thus making a total loss of 20 per cent. of the total calorific value of the gas so treated as compared with gas not cooled. In the case of the gas of an outside producer in gas-works, the cooling is not so severe as this; being usually to about 150° Fahr. Also, the reheating is done by the waste heat of the gases from the setting; so that it costs nothing. The loss is therefore not more than about 10 per cent. of the gas. There is a certain amount more lost as radiation from the producer; but a total loss of 20 per cent. from all sources would be an excessive allowance. It probably does not exceed 15 per cent. A very little irregularity in the working of two or three small generators would balance this quantity, even if in the ordinary course they worked to as good a carbonic acid standard. Mr. Valon admits this in principle; saying that "ignorant and careless handling is probably responsible for fuel losses far greater than the difference between generator and regenerator." If he had included the outside generator with these alternatives, the statement would have been equally true.

The concluding observation of Mr. Valon's essay is a hard saying—that, after all that has been said and done in this regard during the past twenty years, more than half of the settings now put in "are not a whit better than those of seventeen or eighteen years ago." Without pinning oneself to the exact proportion, which might be hazardous, and would certainly be pure guess-work, it is permissible to believe that there is a good deal of justification for this remark. So far as mere fuel economy goes, there are, and always have been, works in existence where, for good and sufficient reasons, direct firing has been preserved, and has proved nearly or quite as cheap as gaseous firing. Of course, this is not to say that gaseous firing is wrong; it only indicates that every improvement is not equally necessary everywhere. Gaseous firing has other advantages besides—usually, economy of fuel; and these remain peculiar to it. We shall not go into these consequential matters, from which Mr. Valon kept free; but merely repeat that the work which has been done in this fruitful field of twenty years was not in vain. The pioneers had a great deal of heavy and mostly thankless toil to get through, and not the least of their difficulties consisted in the hypothetical nature of the benefits they sought. People who had dipped into the text-books read there that it is a losing game to burn solid fuel to carbonic oxide, and then to burn the carbonic oxide to carbonic acid, as compared with burning the same fuel directly to carbonic acid. There could not be a more hopeless quest, on the face of it, than that of advantage of any kind from the burning of fuel in this divided manner; yet it proved to be one of the greatest economical and industrial triumphs of modern times.

THE CALCULATION OF THE ISOTHERMAL FLOW OF GAS IN LONG PIPES.

In the course of the evidence of Mr. H. A. Humphrey before the Lords Committee on the North-Western Electricity and Power Gas Bill, reference was made to an amendment, for application in the case of high pressures, of the formula for the transmission of gas. The matter has interested several gas engineers who were concerned in the Bill; and Mr. Humphrey has kindly responded to an application we made to him for a copy of the formula for publication. In a covering letter, Mr. Humphrey says: "I am not surprised at your asking me for the correct formula to be used in the case of high-pressure transmission of gas where the usual formula to be found in gas engineers' pocket books ceases to hold good, as this matter is bound to be of interest to your readers. It must be explained, however, that the amendment is not my own any more than other formulæ which necessarily follow from the correct application of first principles. It is, in fact, no other than the formula for the isothermal flow of gases in pipes, and was first worked out by Professor Unwin, F.R.S., in connection with the calculations regarding the proposed air-mains in Paris.

Formula for the Calculation of the Isothermal Flow of Gas in Long Pipes.

P_1 = Initial absolute pressure in lbs. per sq. ft.
P_2 = Final absolute pressure in lbs. per sq. ft.
T = Absolute temperature in degrees Fahr. (461 + t° F).
L = Length of transmission in feet.
V = Volume in cubic feet of 1 lb. of gas.
u_1 = Initial velocity of gas in pipe (feet per sec.).
c = Constant in $PV = cT$.
m = Hydraulic mean radius $= \frac{d}{4}$ for circular pipes.
ζ = Coef. of friction (see below).
g = Acceleration due to gravity = 32·2.
d = Diam of pipe in feet.

$$\text{Then } u_1 = \sqrt{\left\{\frac{gcT\,(P_1^2 - P_2^2)}{P_1^2\left(\zeta\frac{L}{m} + 2\log_e\frac{P_1}{P_2}\right)}\right\}} \qquad 1$$

$$\zeta = \cdot0027\left(1 + \frac{3}{10d}\right) \qquad 2$$

CORRUGATED RETORTS.

Corrugated retorts have not been favoured in this country with a trial on an extensive scale; in fact, they have been regarded somewhat in the light of a novelty. Most gas engineers who have given any serious consideration to them have come to the conclusion—though not always, we fear, as the direct consequence of experiment—that the reduced thickness of the retort is not compatible with machine stoking, and that the corrugations might have some effect in arresting the discharge of the spent charges. Now in regard to the first objection, circumstances alter cases; and as to the last we have (as the recent article on the new electric turbine charger and electric discharging ram at La Villette Gas-Works in Paris showed) seen charges cleared from corrugated retorts in a manner that was strikingly good. It will be remembered it was stated that the retorts at La Villette on which the new machines were working were all corrugated, and that "the

charges which the turbine machine projects into the retorts are heavy ones—450 kilos., or about 9 cwt. For this sized retort," it was added, "these are large; and it says something for the splendid heats of the settings that they were found to be thoroughly carbonized." Now Messrs. Teissier and Nègre, who are the owners of the corrugated retort system, call attention to this statement, and remark that it should be made clear to readers "that the 'splendid heats' spoken of are due to the corrugated form of retort." It does not appear to them that the importance of the corrugated form of retort was sufficiently recognized in the article in question as "being the principal cause of the splendid heats and thorough carbonization of the heavy charge mentioned in retorts of the size named"—6 metres through, by 64 centimetres by 35 centimetres. However that may be, certainly the objection as to the use of charging machinery with corrugated retorts does not hold good, judging from the experience at La Villette, with machines of the projecting type. There the machine and the discharging ram had been at work for some months experimentally on the retorts examined and which were seen operated upon, and certainly they were in excellent condition, notwithstanding that the settings showed signs of not having been recently constructed. We are pleased to hear this testimony. Knowing how cautiously the Paris Gas Company proceed in considering the adoption of new processes, we may be sure of this, that it is not without very strong reasons that, after four years' trial, they acquired a licence from Messrs. Teissier and Nègre, for their own use, and have, as opportunity offered, substituted the corrugated retorts for those of the horizontal type.

WATER-WORKS DIRECTORY AND STATISTICS.

We have received from the Publishers (Messrs. Hazell, Watson, and Viney, Limited) the 26th issue of the above-named work, which in the matters of bulk and fulness of contents surpasses every one of its predecessors. The reason for this change is explained in the preface to be the appreciation by the British Association of Water-Works Engineers of the general information which has hitherto been given in the book, and their desire to co-operate with the Editor in making it more complete. Accordingly, by special invitation of the Secretary (Mr. Percy Griffith, M.Inst.C.E., F.G.S.), information of a very comprehensive character—including the nature, size, and geological and engineering features of many of the undertakings, as well as the character of the water furnished—has been added; thereby immensely enhancing the value of the directory as a work of reference to all who are interested in questions of water supply. The additional matter has rendered necessary the re-arrangement of the contents; and the double-column system, which has been in use for some years, has been discarded. This is a decided improvement. One has not to dip very far into the book to find striking evidence of the combined labours of those who have been engaged in producing it; for whereas in the directory for 1901-2 the particulars in regard to Aberdeen were contained in about 25 lines, they now occupy 40—a really valuable new feature being the capacities of the pumping-stations and the service reservoirs. Barry is an even more striking example of useful amplification of details; and it the more deserves to be signalized from the fact that at the end of the half-dozen short lines given in the 25th issue of the directory there appear the words: "No returns supplied since 1898." Now they occupy a page and one-third, or about 35 square inches. It is unnecessary to cite other cases, as it will have been gathered from what has been already said that there has been a general extension on the lines indicated. It should be mentioned that several maps now appear in the book. The statistics are preceded, as hitherto, by a general index of officials of water-works, and a list of the Associations of Water-Works Engineers in England, Germany, and the United States. Of course, the accuracy of the particulars can only be tested, as in all similar works, by the use of the book; but our readers may be certain that the Editor and those who have been associated with him have done their best to ensure it.

MONAZITE SAND AND THORIUM.

It is some time since we have had anything to publish respecting the position of the two important substances mentioned above—important in the highest degree at the present time to all connected with incandescent mantles as makers, dealers, or users. However, we may take credit for this, that the articles (which were the outcome of suggestions received from a well-informed correspondent) previously published on this subject—though pooh-poohed in some quarters—may have important issues for all in this country directly or indirectly interested in the incandescent mantle industry; and we hope to have the pleasure before long of putting readers in possession of further intelligence. Meantime, among those who took the articles referred to seriously were the New Export Incandescent Lighting Company, Limited, of 36, Mansell Street, E.C.: and they immediately placed themselves in direct communication with the Commercial Department of the Board of Trade, and urged that the question of the supply of monazite sand, being of such vital importance to the large and growing industry and trade in mantles, was one that, in the public interest, should be taken up by the Board andinquiries instituted as to the position, both in Brazil and the United States, through H.M. consular agents. The New Export Incandescent Company have submitted the whole of the resulting correspondence to our perusal, and have handed to us for publication the following summary of the contained facts:—

The documents received, as the result of our [the New Export Company's] correspondence, inform us that it has been officially ascertained that "many square leagues" of monazite sand exist both on the foreshore and in the interior of the States of Espirito Santo and Bahia—the former belonging to the Federal Government, and the latter to the individual Governments of the States named. No large quantity has been hitherto exported; but a Mr. Gordon—an American citizen—has exported some found on private lands. An inquiry has been set on foot by the Federal Government to determine the rights of the respective States, and to arrive at an agreement as to working the deposits.

A contract was entered into with Messrs. Schnitzpahn and Co., on Dec. 31, 1901, which has since fallen through. In December, 1902, by the Budget Law 953, "the Government were authorized to lease to the highest bidder the right to work monazite sands located on lands within the jurisdiction of the Union, or to invalidate the contract Dec. 31, 1901 (with Schnitzpahn), on the most convenient terms, with fines in case of infraction, or to enter into an agreement with the Governments of the States of Bahia and Espirito Santo to settle some common plan for working monazite sands in their territories." The concession to Messrs. Schnitzpahn was for ten years, and related to the foreshore deposits only. It was contained in a document [which we have seen] of sixteen clauses, the principal of which, Nos. 4 and 5, read as follows: (4) "The contractors shall be obliged to pay to the Federal Government 40 per cent. of the gross value of the sands extracted, payable at the moment of their exportation, liquidating later the accounts, when the invoices, legalized by the Brazilian Consul, are produced at the places where the sales shall have taken place." (5) "The 40 per cent. shall be reckoned on the minimum value of the annual export to which the lessees are pledged—viz., (*a*) 1000 tons at a minimum price of £20 a ton, or £20,000 per annum; or (*b*) 2000 tons of worked sands at the minimum value of £18,000.

Under date March 16, the Board of Trade, however, advised us that the concession was to be varied, and that any new concession would be limited to five years, instead of ten, and to a given area in the State of Espirito Santo. Other conditions are 40 per cent. *ad valorem* of sand exported to the Government as before, with a minimum guaranteed export of 1000 tons, with a premium of £5000, caution money £2500.

These reports have been handed by us to a well-known firm of English manufacturing chemists; and negotiations, we understand, are now proceeding at Rio Janeiro to obtain a concession in the interest of British merchants; and, by the aid of H. M. Minister (which has been promised), it is hoped they will be carried to a successful issue.

The official analysis of the Brazilian sand is—

Thorium	1·5 to	3·0	per cent.
Yttrium	1·0 to	3·0	,,
Cerium	62·0 to	70·0	,,
Aluminium		3·0	,,
Iron	2·5 to	5·0	,,

With regard to the American deposits, the latest information was sent by H. M. Ambassador at Washington (under date April 22, 1903), and reads: "The area of land containing deposits of monazite sand in North and South Carolina is very indefinite; the sands being found in the beds of various small streams over an area of perhaps 50 square miles. There are no restrictions on the working; and it is principally purified at Gloucester, New Jersey. The price paid to miners for the crude article is 3½ to 5 cents per pound, or, thoroughly cleaned, 8 cents. Prior to 1887, 24,000 lbs. were shipped; in 1895, 1,573,000 lbs. (value $137,150); but in 1898 it began to decline, owing to the Brazilian article coming on the market. The commercial sand contains 70 to 90 per cent. of monazite; and ten different samples gave these percentages of thorium: 2·15, 2·25, 6·54, 1·27, 6·30, 2·48, 5·87, 6·26, 3·98, 1·93—averaging 3·9. Inquiries are also being made in Canada, the results of which will be known later."

Alcohol-Hydrocarbon Gas.—Writing in the "Zeitschrift für Spiritusindustrie," Herr D. Mohr describes the manufacture of the above-named gas by Pampe's process. Alcohol and petroleum are admitted, from separate tanks, into a vaporizing retort placed at the back of the furnace, where the emulsion of spirit and hydrocarbon is vaporized. The vapours pass into a gasifying retort, situated in the front of the furnace, and are completely gasified without the production of tar or other bye-products. The hot gases are then led out round the vaporizing retort, to which they supply heat to assist in the vaporization. The gas produced has a penetrating, disagreeable odour, which facilitates the detection of leakages. Its lighting and heating powers are stated to be very high. Used with a Welsbach mantle, it gave 67 Hefner candles, with an hourly consumption of 66 litres of the gas containing 10 per cent. of air (or 59·4 litres of the air-free gas). The efficiency is still higher with a mixture containing from 25 to 30 per cent. of air. Such a mixture can be supplied from gasholders for consumption, as only those mixtures are explosive which contain above 6 and below 21 per cent. of the gas. With regard to heating power, 1 cubic metre (35·3 cubic feet. measured at 15° C. and 760 mm., gives 7400 calories, against about 5000 calories from coal gas. The cost of the gas, inclusive of wages, repairs, depreciation, and fuel, is about 21 pf. per cubic metre which is much less than oil gas, though dearer than coal gas.

PERSONAL.

Mr. R. J. Sharman has resigned his position as Manager of the Wisbech (Cambs.) Gas-Works.

Mr. John F. Black, who has for some years been Assistant to his father, Mr. John Black, has now been promoted to the position of Manager of the Newport (Fife) Gas-Works.

At the meeting of the Metropolitan Water Board on Friday, it was announced that Mr. William Terrey, the General Manager of the Sheffield Corporation Water-Works, had withdrawn from the appointment of Clerk to the Board, on the ground that no provision had been made for a superannuation allowance.

Mr. J. R. Sutherland, the Assistant-Engineer in the Water Department of the Glasgow Town Council, was on Thursday last elected to the post of Water Engineer, vacant by the resignation of Mr. J. M. Gale. Mr. Sutherland has been for 14 years in the employ of the Corporation, and latterly has had charge of the works. The salary is £700. Mr. Gale's salary latterly was £1500 a year. There was proposed also Mr. M. R. Barnett, of Lancaster, who has had experience in connection with both the Glasgow and the Manchester Corporation Water-Works. The voting was: For Mr. Sutherland, 30; for Mr. Barnett, 17.

Although no official information on the subject has been received, it appears to be common knowledge among gas men in the City that important changes are pending in connection with the Distribution Department of the Gaslight and Coke Company. It is stated that a third department is to be created, under new management, to deal direct with the consumers, and with a staff who will specially devote their energies to the development of new business. This will carry with it a lessening of the work in the present Distribution Department, the duties of which and of the Engineer, Mr. G. F. L. Foulger, will be restricted entirely to the work appertaining to the distributing system—that is to say, from gasholder to service-pipes. Beyond, the new department will come into action.

Mr. W. Ingham, Assoc.M.Inst. C.E., who is leaving Torquay to take up the position of Water-Works Engineer at Port Elizabeth, Cape Colony, was on Wednesday presented with an illuminated address expressing the Torquay Town Council's appreciation of his services. The Mayor (Mr. J. Taylor), who made the presentation on the occasion of the Corporation's annual visit to the water-works, spoke highly of Mr. Ingham's services as Water Engineer during the seven years in which he has held the position, and said that every member of the Corporation had subscribed to the presentation—an event which he thought was unique on the occasion of an official of the borough leaving the service of the Corporation. Mr. Ingham, in reply, said he had spent a very pleasant time in Torquay; and as regards the water undertaking, if he had to go over the work again, he should give exactly the same advice as before. He was very glad that he was to be succeeded by Mr. Chapman, with whom he was associated at Plymouth. The Corporation could not have found a better man. The Mayor gave Mr. Chapman, who was present, a cordial welcome as Mr. Ingham's successor.

OBITUARY.

Mr. Andrew Tait, late Manager of the Peebles Gas Company, died at his residence, Borthwick Cottage, Peebles, on Sunday, the 24th ult., in his 85th year.

The recent death is announced of Mr. E. T. Brydges, the Town Clerk of Cheltenham. Deceased had been closely identified with the water supply of the town; and in 1878 he promoted a Bill for the acquisition by the Corporation of the undertaking of the Cheltenham Water Company, and succeeded in carrying it through Parliament in the face of strong opposition. He was in his 77th year.

There has recently been some discussion in the columns of "Science" as to who first made use of the word "barometer." It occurred in a paper by Boyle in the "Philosophical Transactions" for 1666, and also in an anonymous article in the same publication in 1665. According to a correspondent of "Nature," the word is used in 1665 in "The General History of the Air . . . by the Hon. Robert Boyle, Esq.," published in London in 1692. Our contemporary has referred to the work and to the article in question—viz., "A Short Account of the Statical Baroscope, imparted by Mr. Boyle, March 24, 1665, in a Letter to Mr. H. Oldenburgh." The sentence runs as follows: "When I come to another Place, where there is a Mercurial Barometer, as well freed from Air as mine (for that must be supposed), if taking out my Scale-Instrument, it appears to weigh precisely a Drachm, and the Mercury in the Baroscope there stands at 29½ Inches, we may conclude the Gravity of the Atmosphere not to be sensibly unequal in both these two Places, though very distant."

TECHNICAL RECORD.

OHIO GASLIGHT ASSOCIATION.

(*Concluded from p. 522.*)

Domestic Heating by Gas.

Mr. Donald M'Donald, of Louisville (Ky.), opened a discussion on the above subject. He said that if this department was worked with great energy without discretion, it would simply result in the overtaxing of the gas-works plant for a few days in the year, with but little income during the remainder; and there would be much dissatisfaction on the part of the consumers. But if zeal was tempered with discretion, it would prove very profitable, and sales of gas might be more than doubled. The price must be low, not necessarily to compete with solid fuels, but to secure its adoption to any important extent. Probably 2s. 6d. per 1000 cubic feet of 650 B.T.U. gas was about the top price; and at a lower figure sales would be much larger. It was poor policy to encourage the use of gas for any purpose where it would not answer. No gas company wanted the exclusive heating of a house. What they did want was the mild weather heating in the spring and fall; and if people were correctly informed, the selling price would take care of the rest. Even at 2s. per 1000 cubic feet, gas was expensive for constant firing; but it was convenient and economical for occasional or supplementary use. Properly applied in this direction, there would be a steady demand for fifteen hours out of the twenty-four. In dining or other rooms used only for an hour or two at a time, the gas-stove was a great convenience; and in humble tenements there was a good trade for gas-stoves as supplementary to the coal-fire, which could be relied on as the main source of heat—gas being used in comparatively mild weather, or when it was not convenient to use coal. For temporary supplemental heating, an open front stove without a flue was recommended as the best fixture. The flame would get an ample supply of air, combustion would be complete, nothing but carbonic acid and water being produced, and the ventilation of the other fires would carry these away. If radiators or other enclosed heaters were used, the air supply openings were apt to become choked, leading to incomplete combustion, with its well-known annoyances. In bedrooms, or where gas was the only source of heat, a close stove with a good flue was recommended. The flue must be so arranged that a down-draught is an impossibility, also to avoid waste by drawing excess of air; otherwise it would be worse than useless. A sufficient supply of air to ensure complete combustion, escaping at 300°, would only carry off about 5 per cent. of the total heat; but closed stoves, as usually constructed, sent up the chimney anything between 20 and 80 per cent. Any device that only drew off part of the products, leaving the remainder free to escape into the room, was simple folly. Unless all the products were sent up the chimney, it was more sensible not to send any. Before entering this desirable field, the manager must be equipped with knowledge, energy, and patience necessary to steer his customers clear of numerous mistakes; for the perfect gas-heater was not yet made. Therefore it was better, instead of recommending any special make, to aim at keeping out apparatus constructed on wrong principles or sold under any misrepresentation, intentional or otherwise.

Discussion being invited, Mr. Whysall agreed that it was better to keep all the products in the apartment than to send a portion only up the chimney. In his experience, customers would spend a fixed sum for fuel annually—perhaps £12 or £14; and if they were supplied at a flat rate, the business would be as profitable as a low meter rate. If the price was raised, there would not be any appreciable difference in the actual amount paid; but they would decrease the number of fires, and exercise more economy in consumption. Mr. F. H. Shelton said that in connection with this subject it might be well to bring out the effect of abnormal coal conditions as experienced during the last year, and likely to recur from time to time. He was interested in several companies in Pennsylvania; and there they attributed 20 per cent. increase of business to the scarcity of anthracite. Instead of falling off in September as usual, the cooking season kept on up to Christmas. In connection with heating, some interesting attempts were made to utilize discarded gas-heaters, or to rig up appliances at short notice. He agreed generally with the statements made by Mr. M'Donald. Mr. Persons said that there were a lot of inefficient heaters on the market. He believed a simple star burner was the most economical and best for the gas company in the long run. He suggested that gas companies should make careful tests to find out the best stove, and then sell that at such a low rate that it would crowd inferior makes off the market. Many of the appliances now offered for sale simply prejudiced the business. Mr. M'Ilhenny supported the line of policy for gas companies as recommended by the opener of the discussion. Gas managers with a large heating connection must be prepared for considerable fluctuations, according to the climate, and for an increased maximum demand in cold weather. He had seen a stove that not only removed the products of combustion, but also brought in fresh air from outside. He quite believed that this was the thing

required. Mr. Stone, being asked to give his experiences with natural gas, said that, provided the right appliances were used, it was quite as cheap as coal, if not cheaper. For an ordinary house of six or eight rooms, the bill averaged £1 5s. per month, or perhaps as much as £1 13s. 6d. in the heaviest winter months. But if an attempt was made to utilize the ordinary hot-water furnace, the cost would exceed that of coal, and be quite double these figures. In his own house, the cost for all purposes—heating, cooking, and lighting—was as follows: November, £1 1s. 6d.; December, £2 3s. 6d.; January, £2 12s., and February, £2 3s. 6d. In another instance, the average for five years, in a fourteen roomed house, gas being used for all purposes, was less than £20 a year. He knew of small towns supplied with natural gas where the meters average one to three or four of the population, and the average per meter in the winter months was over £2 10s.; and yet there was no complaint. The quality of the gas was close on 1000 B.T.U., and the net price only 25 c. per 1000 cubic feet. Some day (it might be many years hence), he would have to fall back on artificial gas, and had laid all new extensions with this idea in view. People must be educated to the use of gas, and not allowed to think that it can be employed anyhow or anywhere. With regard to fluctuations in demand, gas engineers must get a system of manufacture that was more flexible than the present one. They must avail themselves of high-pressure distribution, which, if properly carried out, was not more costly than low pressure, either as regards initial or working expenses. Mr. Barnes said he was developing a district of 60,000 to 70,000 consumers for fuel purposes, supplied with the natural gas at 25 c. per 1000 cubic feet, and the consumption per consumer had been constant, for some years, at 166,000 cubic feet per annum. Of course, the consumption per month varied more. In the summer there were some 7000 consumers who took less than 2s. worth per month, using gas for cooking only. He could compete with coal using hot water or steam, but not hot-air apparatus. Careful tests extending over two or three years showed that a hot-water system was some 15 per cent. cheaper than coal. Mr. Doherty pointed out that radiated heat was the thing wanted, and that the most successful heater would be the one that gave the highest percentage in that form. The stove must be cheap. While in some districts house heating was a good line, in others it was not. Heating was all very well in conjunction with other uses, but by itself would not be profitable if the gas cost nothing to make. In Denver, the Backus heater had taken on well. He found that in extra cold weather they were all turned on, and that if many more of them were put in, it would mean a large increase in the maximum demand, and a large increase in permanent investment. The question of high-pressure distribution did not touch that of the load-factor, and compression must mean a certain thermal loss due to subsequent re-expansion without re-heating. Mr. Shelton said that the cost of compression was ¾d. to ¾d. per 1000 cubic feet. Of course, much depended upon the volume dealt with. The loss of illuminating power by compression to 15 or 20 lbs. might be 1 or 1½ candles; but for all practical purposes, the compressed gas was as good and as saleable as before compression. There was no trouble from deposition after the first 1000 yards, or after the heat from compression was lost; and the saving in outlay was great. He instanced a 6-inch trunk main, 9 mains long, that was serving 2000 consumers. Mr. Eysenbach said he had compressed natural gas to 250 lbs. by the use of 3 per cent. of the gas as fuel. The President related some of his experiences with coke-ovens at Hamilton, Ohio, where he made much more gas than was required for ordinary lighting. He started by putting gas under twenty house furnaces, with no special attention to the kind used, whether steam, hot water, or air. As the result, his surplus was fully disposed of. In his residence, an ordinary fourteen roomed house, the maximum consumption in January was 3000 cubic feet per day, using an ordinary hot-air furnace. With hot water, the consumption would only be about 2000 cubic feet. As compared with coal, the value of the gas was 3d. to 4d. per 1000 cubic feet. He agreed that it was out of the question to undertake to supply gas for heating throughout the winter. To get gas used as fuel to any extent, it must be sold at 2s. 6d. per 1000 cubic feet or less. Mr. M'Donald, in the course of his reply, agreed with much that had been said, but differed decidedly with the idea that companies further south could take up entire heating. On the contrary the further south one went, the greater would be the difference between the average and the maximum demand. Some winters there would be no business worth having, and in others a large demand for a day or two only. If he could get gas for nothing, and enough of it, in cold weather, he thought he could earn a profit out of the distribution.

Novelty Advertising.

Mr. B. W. Perkins, Editor of the Novelty Advertising Department, presented a report. At Norriston, Pa., round pasteboard discs, 2 inches diameter, were distributed to school children, and generally with good effect. They carried inscriptions such as "My Mamma Uses a Gas Range," "Use Gas for Fuel," "Use a Gas-range," "gas is reliable," &c. Similar inscriptions were put on the meter statement slips, or the bills. The "poor man's stove," consisting of a circular sheet of galvanized iron, supported by three wires at a height sufficient to avoid interference with the light, costing about 3d. each, were given away by the thousand with good results. At Stapleton, N.Y., small advertising plates were attached to all capped-off services or pipes in houses. The use of a glass-case meter in the show-room was recommended. All sorts of cheap trifles for conveying such legends as "buy a gas-range" were also instanced.

Differential Rates.

A discussion on this question was next taken. Mr. Butterworth thought that the general opinion on the part of the public was in favour of discounts according to quantity consumed, but that differential rates based on the purpose for which the commodity was used were unjust and unreasonable. Mr. Perkins considered that the matter should be determined by local conditions, but was not a believer in differential rates to any great extent, except as based upon quantity. Mr. Roper wished to hear some expression of opinion upon the subject as applied to gas-engines when in competition with electric motors, because the electricians made a vast difference according to the amount of power used. He had a contract for electricity; and if he used over 2000 units, he obtained a large reduction in price. He would like to know why gas should not be sold on similar terms. If in running a plant he used 60-horse power for 10 hours a day regularly, and for two hours of that time went up to 90-horse power, what should be the charge for gas under these conditions? Mr. Coombs agreed with discounts according to quantity used. Mr. M'Ilhenny said that many gas companies offered special terms to large users for industrial purposes, and, he understood, with satisfactory results. There was a rising demand for business of this class. Mr. Doherty said there was a growing belief, among the electrical companies, that something more than a discount according to quantity was required, and that the tendency was towards a charge based on the expenses occasioned by each consumer. The expenses per unit of current sold depended on something more than the mere quantity consumed, such as the portion of the plant used. There was no electric supply company that would not be better off without some 30 to 50 per cent. of their customers, possibly including some of the largest. Take a factory running all the year through which closed at 5.30. They only required light for two or three months in the year, and then only for half-an-hour to an hour per day. Out of 90 hours' use of a certain amount of plant, the suppliers had to get enough to pay interest and fixed charges over the whole year. Perhaps in these three months they would take £100 worth of current, and nothing in the remainder. The same argument applied to gas. The load-factor of a company supplying gas for lighting alone would be very low. A plant would have to be provided and maintained capable of furnishing ten times the actual output. With fuel gas there would be a higher load-factor, and proportionately less interest and fixed charges; and on this ground he justified a lower rate for fuel gas. He referred to a chart published in the "Question Box" pamphlet, showing that at Denver the peak-load for fuel-gas consumers was much lower than that for lighting gas; and the nearer the plant could be worked to its maximum capacity, the lower would be the fixed charges per unit of output. The question was, what proportion of the total expenditure was of the nature of fixed charges not dependent upon output. This was a matter that could only be arrived at by analysis of the accounts in each case. It was possible to determine what expenses would be increased by additional consumption per consumer, or by additional consumers. At Denver, the cost of meter inspection and office work was about 15s. per annum. Take a consumer who used 6000 cubic feet per annum and paid 25s. for it; deduct the 15s., and only 10s., or 1s. 8d. per 1000 cubic feet, remained to pay the other expenses. A consumer who used 12,000 cubic feet per annum, and paid 50s., also cost 15s.; and this left 35s., or 2s. 11d. per 1000 feet. If they could sell to the small consumer at 15s.+1s. 8d. per 1000 cubic feet, they could also sell to the larger ones on the same terms. The factors upon which the charges should be based were not only those per 1000 cubic feet output, but per consumer, and especially those which were influenced by maximum demand. He could not imagine a more inequitable way of selling than a fixed price per 1000 cubic feet, regardless of other conditions, and the next few years would witness a radical departure. It was a question of load-factor and consumption per consumer more than anything else; and the man who used gas intermittently or on emergency, should pay more than one who used it ten hours a day. For short intermittent use, an electric motor was cheaper than a gas-engine; but for anything like regular use, the gas-engine was far the cheaper. He should say, roughly, that gas at 2s. 9d. per 1000 cubic feet was equivalent to electricity at 1½d. per unit, for power.

The Question Box Replies.

Mr. Doherty drew attention to the uncertain and discordant character of some of the replies to questions in the Question Box Department, and proposed the appointment of a Committee to encourage research on such questions as standard methods for testing the efficiency of fuel-gas appliances, the specific heat of gases at various temperatures, and the deterioration of coal by storing, to have power to secure funds by voluntary subscription, to select subjects, and to recommend the award of specially engraved certificates in recognition of research work. This was agreed to.

After the election of officers for next year and other business, the usual votes of thanks were passed, and the meeting closed.

JUNIOR GAS ASSOCIATION FOR YORKSHIRE.

A short time ago the initiative was taken for the formation of a Junior Gas Association for Yorkshire. A Provisional Committee was formed, with Mr. Fred Scholefield (of Dewsbury) as Hon. Secretary, *pro tem.*, and a set of rules drafted. These were submitted to a general meeting of intending members held in the Chemical Lecture Theatre of the Bradford Technical College on the 23rd ult, and, with slight additions, adopted. It was originally proposed to confine the operations of the new body to the West Riding; but, according to the rules, its name is to be "The Yorkshire Junior Gas Association." It is to consist of both ordinary and honorary members. The qualification of the former is to be the holding of a recognized official position, or a certificate in "Gas Manufacture," by a person engaged at a gas-works, or at any works dealing with residual products, or otherwise associated with gas manufacture except in connection with the making of gas appliances. Honorary members are to be elected, at the discretion of the Council, from persons associated with gas manufacture, but not engaged in the production of gas appliances; and they are to be eligible to take part in the reading of papers, discussions, &c., but not to hold office or to vote. The objects of the Association are: (*a*) To devise means for helping and extending the technical knowledge of its members. (*b*) The reading of papers by members and others, and discussions thereon. (*c*) The delivery of lectures. (*d*) To hold conferences and meetings for the discussion of matters of general interest relating to the gas industry. (*e*) To form a library for the use of members. (*f*) To collect and publish records of events of service and interest to members. (*g*) To arrange excursions to works, &c."

The Association is to be governed by a Council, which will consist of a President, Vice-President, Treasurer, Hon. Secretary, and six other members, who, together with two Auditors, are to be elected by ballot at the annual general meeting. The session will commence with the annual meeting, to be held on the 31st of October next at Leeds. In the meantime, the Provisional Committee will make all the necessary arrangements.

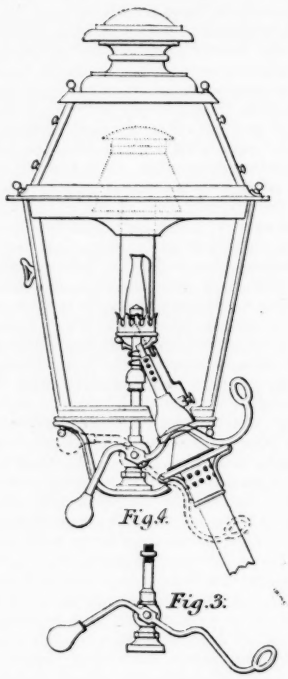
ASSOCIATION OF DUTCH GAS ENGINEERS.

General Meeting Programme.

It is announced that the Thirty-First Annual General Meeting of this Association will be held on Wednesday and Thursday the 8th and 9th of July, at Haarlem, under the Presidency of Heer J. Blom, the Manager of the Municipal lighting works of that town. After the transaction of private business, which includes the appointment of Editors of the official organ of the Association—"Het Gas"—in succession to Heeren C. T. Salomons and P. Bolsius, whose term of office expires at the close of this year, the President will give an account of the Haarlem Gas and Electricity Works, which will subsequently be visited by those attending the meeting. The further technical proceedings comprise the consideration and discussion of a number of questions, of which the following is a summary of the headings: (1) How large must the annual make of a gas-works be for inclined retorts, with appropriate conveying plant for coal and coke, to pay? (2) Can mechanical stoking plant be introduced with advantage into gas-works of moderate size equipped with horizontal retorts? (3) Has the charging machine of C. Eitle been tried in Holland? (4) Have the retorts, &c., of the Dutch Fire-Brick Company, of Rotterdam, proved satisfactory? (5) How does the cost of coal gas compare with that of carburetted water gas at the present prices of coal and oil? (6) What is the best place for mixing coal gas and water gas? (7) Has a mixture of coal gas and water gas higher calorific and illuminating values than would be calculated from the mixing of its components? (8) The advantages to be gained by introducing a naphthalene washer. (9) The formation of cyanogen and ammonium compounds in the retort. (10) The influence of the presence of ammonia on the abstraction of cyanogen in the purifiers. (11) The factors which determine the proportion of carbon in coal tar. (12) The use of rubber seals for purifying vessels. (13) The determination of the completeness of revivification by ferric oxide. (14) The latest improvements in dry gas-meters. (15) Whether the Association should undertake investigations on the relation of the nominal illuminating power of gas to the light which it affords in the Welsbach burner, and to its calorific power. (16) What is the most trustworthy carburetting agent so far as permanency is concerned? (17) The best photometer for both coal gas and carburetted water gas or mixtures of the two. (18) What is the most suitable illuminating power for gas? (19) Improvements in Junkers' calorimeter. (20) Experiences on the injurious effects of vagrant electric currents. (21) Experiences with the three-shift system, and where it has been introduced. (22) Leakage of oxygen when stored in iron vessels. In addition to these subjects for debate, the reports of various Committees appointed by the Association have to come before the meeting.

ACETYLENE LIGHTER FOR INCANDESCENT BURNERS.

In a short paper read by M. Bachelay, Manager of the Toulon Gas-Works, at the annual congress of the Société Technique du Gaz en France, he described the application of acetylene to the lighting of street-lamps in which incandescent burners are used. He had previously devised an acetylene lighter for flat-flame burners; and in his later device he adjusts matters so that the insertion of the lighter into the lantern turns on the gas and ignites it at one operation and almost with one hand—a combination which he indicates by calling his appliance *une lampe pour manchot* (a "one-hand lamp"). In this way the slight explosions which are so detrimental to the life of mantles are obviated. The appliance consists of a generator at the end of a rod, prolonged



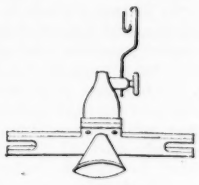


Fig.2.

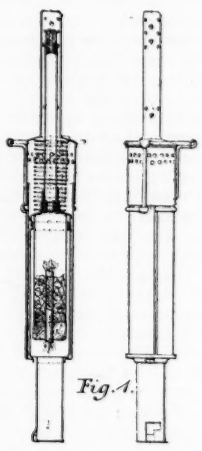


Fig.1.

into a burner, and surrounded by a perforated cylinder held in position by a spring fixed to the top of the generator. When the spring is relaxed, the acetylene frame remains within its protecting cylinder; but on pressing the spring, the burner emerges. By providing a cone for the insertion of the lighter, and arranging therein a lever from the cock of the incandescent lamp, the gas will be first admitted to the lamp, and then, as the spring is pressed, the acetylene flame emerges and lights the burner.

Fig. 1 shows the generator, fig. 2 the lighting cone, fig. 3 the lever attachment for the gas-cock, and fig. 4 the lighter in action.

The system can be applied to all patterns of lamp, and a slight alteration in the lever permits of existing cocks being used.

CONTROLLING MAKE BY A PRESSURE-REGISTER.

The use of a pressure-register in the Villefranche Gas-Works induced M. Chervet, the Manager, to draw attention to the advantages to be obtained by this apparatus in controlling the make of gas. The apparatus registers the pressures full scale, and the paper travels at a speed of 23 mm. (about an inch) per hour. Between the mains and the register there is fixed a pulsation absorber, with the object of enabling the pen of the register to keep pace with the alterations in pressure uninfluenced by the throbs of the exhauster. This is accomplished by means of a copper tube about 50 mm. (2 inches) in diameter and 300 mm. (12 inches) long, divided into six compartments by means of five diaphragms, each pierced by a small central hole. The two extremities are closed by screwed caps, in order to easily dismount the appliance, and are connected with the mains by nippled cocks and rubber pipes. The loss of load resulting from the passage of the gas through this apparatus is sufficient to remove the pulsations of the injector without affecting the precision of the readings given by the pressure-register. These readings indicate, first, variations in output, and, secondly, obstructions. The course of the curve remaining the same, the ordinates will increase as the resistance increases. These two phenomena can easily be confused at first glance if the general course of the curve is not highly characteristic.

The pressure-register is very usefully supplemented by

recorder of the make of gas, the indications of which at once make clear the readings of the former. Assuming that retort-charging is done with the scoop, and reckoning that at least three men will be necessary, it will be apparent that up to five men there is no fear of two retorts being charged simultaneously. Under these conditions, three settings of nine retorts will work at one time, and produce from 6000 to 7000 cubic metres (212,000 to 248,000 cubic feet) of gas in 24 hours. In the case of six furnaces—that is to say, with the production of 12,000 to 13,000 cubic metres (424,000 to 460,000 cubic feet) of gas, the control will still be possible by crossing the operations of the two installations should it be necessary. The ratio of the pressure-indicating scale can be increased to 2:1. With a larger make—*i.e.*, in the case of working a number of retorts at the same time—the results will be less accurate; but they will still be valuable, inasmuch as they will show the hours at which each operation is commenced and finished.

THE "BABILLOT" INCANDESCENT BURNER.

Some particulars respecting a gas-burner recently invented by M. Babillot were given in a paper read at the congress of the Société Technique by M. Desforges. In the Babillot model, it seems, the bunsen burner is formed of two long truncated cones, placed with their small sections in contact. This arrangement, which somewhat resembles that of former burners, is highly favourable to the expansion of the current of gas. The injector at the base of the burner has one hole only, so that the escaping gas acts exactly like a Giffard injector. The special feature in the burner is a conical core in the upper cone, producing an annular constriction in which the gas and air form a most intimate mixture. This passes smoothly through the circular channel, and reaches the zone of combustion in a direction which favours its expansion and its contact with the mantle. Moreover, the conical core reaches a high temperature, and so heats the gas passing over it.

The trials of hourly consumption and lighting power made by M. Desforges, in conjunction with M. Jouanne, and cited below, were carried out with two types of mantles, Nos. 1 and 2, taken at random from stock intended for sale.

Burner with Mantle No. 1.

Pressure in Millimetres.	Hourly Consumption. Litres.	Total Lighting Power. Carcels.	Consumption per Carcel. Litres.
60	96	9·10	10·50
50	84	8·60	9·76
60	78	7·30	10·70

Burner with Mantle No. 2.

Pressure in Millimetres.	ourly Consumption. Litres.	Total Lighting Power. Carcels.	Consumption per Carcel. Litres.
80	150	13·26	10·31
60	132	13·00	10·15
50	114	11·01	10·3
40	102	9·79	10·4
30	87	7·75	11·2

It is claimed that these figures show that the burner is more efficient than the majority of those in use at the present time.

Similar trials were made with a much smaller burner with one of the *Bébé* mantles. These gave a lighting power of 5·8 carcels for an hourly consumption of 60 litres—*i.e.*, 10·3 litres per carcel-hour—an excellent result for so small a burner.

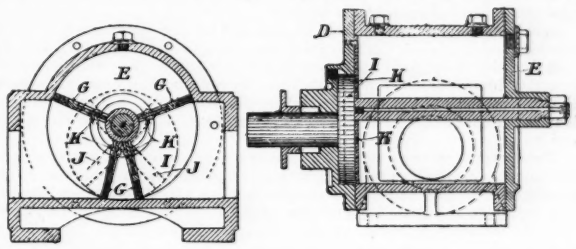
Sulphocyanide Manufacture at the Smethwick Gas-Works.—At the last meeting of the Smethwick Town Council, the Gas Committee reported that they had approved of a proposal from the British Cyanides Company, of Oldbury, for the adoption at the gas-works, under licence, of the Company's process for the treatment of coal gas for the manufacture of sulphocyanides, and for the purchase by the Company of all gas liquor containing sulphocyanides to be produced while working under the licence.

Wilmslow and Alderley Edge Gas Company.—At the recent annual general meeting of this Company, the Directors reported that the profits made in the twelve months ending March 31 amounted to £2490, out of which they recommended dividends of 10 and 7 per cent., less income-tax, on the old and new shares respectively; leaving a balance of £149 to be carried forward. The Engineer and Manager (Mr. W. Severs) reported that the total quantity of coal and cannel carbonized was 4583 tons 5 cwt., from which 51,412,000 cubic feet of gas had been produced—a decrease of 977,000 cubic feet, or 1·9 per cent. on the previous year's make. The average production per ton of coal and cannel carbonized was 11,217 cubic feet. The lower make was explained to be due to two causes—viz., the mild winter, and the number of empty houses in the district; though, on the other hand, there had been sold 220,800 cubic feet more than in 1901-2. This had been brought about by stopping many leakages in the district. Since the previous report, a contract for lighting the Alderley Edge district with incandescent lamps for five years had been secured, after competing with the electric light. The number of consumers on the books was 1325; being an increase of 98. The works and plant had been kept in a thoroughly efficient state, and were in good order. The Directors' report was adopted, and hearty votes of thanks were accorded to them and to the Engineer and Manager.

REGISTER OF PATENTS.

Rotary Pump for Gases and Liquids.—Waller, G., of Stroud, Gloucestershire. No. 10,129; May 2, 1902.

This pump is formed (as shown) by a metal cylinder having inlet and outlet branches, and two covers D E. In the centre of E is fixed a spindle, on which four blades revolve. In the other cover D, and out of its centre, is a spindle with a disc I on one end working in a recess inside the cover D. This disc has four channels or grooves J across its

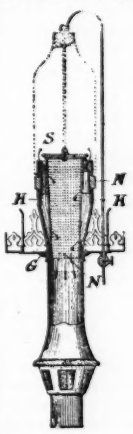


face, in which work four blocks with a hole; and in each hole a trunnion K on the end of each blade is fitted. The rotation of the blades G by the disc I causes the gas or liquid to pass through the cylinder from the inlet to the outlet.

By the adoption of this arrangement of disc with blades, trunnions, and spindles or shafts, the inner drum usually employed with pumps of this description is dispensed with.

Incandescent Gas-Burners.—Ryland, T. J. F., of Coldharbour Lane, S.E. No. 10,840; May 12, 1902.

This invention (in reference to gas-burners, more particularly such as are used for incandescent lighting) consists of "certain improvements upon those hitherto made and used, whereby greater economy of the gas consumed relatively to the candle power obtained by combustion of same," is effected.



The gas nozzle or nipple (as shown) has a number of holes formed in the crown for the passage of gas. The lower end of the mixing-chamber has any number of apertures for the inlet of air, covered by a rotating case for partially closing the apertures and so regulating the inlet of air. The upper end of the chamber terminates with a mouth G, and has an external annular ridge for carrying a chimney gallery in the usual way. The gallery has a central hollow chamber K, the lower open end of which fits upon the mixing-chamber; while its upper and larger open end is fitted with a ring of non-conducting material (preferably steatite) surmounted by a nosing in alignment with the mouth of K. Within the chamber K is placed the device, which consists of a cylinder N of any metal capable of withstanding the heat to which it is exposed, and perforated all over with very small holes as shown. It is enclosed at its upper end by a crown piece, provided with an upright threaded stud for the reception of a spreader S.

The gas enters the mixing-chamber and receives its proper quotum of air through the apertures regulated by the rotating case, and, becoming mixed in the chamber, rises (as indicated by the lower arrows) and enters the lower end of the coned cylinder N, and exudes therefrom through such of the perforations as would be above the mouth G of the chamber (as indicated by the lower curved arrows). From this point, the combustible mixture rises and passes upwardly over the edges of the spreader S, as indicated by the upper curved arrows, at which point it may be ignited. The flame impinges upon the lower edge of the mantle and renders it incandescent; and when the lower edge of the mantle becomes worn, the mantle may be lowered by the adjustment of the supporting rod, so that the lower edge of the mantle may always be in proper contact with the flame, so that "its brilliancy is never lessened by reason of a gap between the flame and the mantle."

Treatment of Coal Gas or other Gases Containing Cyanogen, for Obtaining Soluble Cyanides.—Feld, W., of Hönningen-on-Rhine, Germany. No. 10,876; May 12, 1902.

In the course of his specification, the patentee says: It is known that the cyanogen (or cyanogen compounds) contained in gas produced by the destructive distillation of coal can be obtained in the form of compounds of cyanogen and iron, if the gases be washed by a solution of an iron compound and a hydrate or carbonate of an alkali, or of magnesium, or of an earth alkali, or if the gases be treated by the dry process with mineral iron compounds—or salts, or iron compounds produced by precipitation—the iron compounds being mixed with a hydrate or a carbonate of an alkali, or of an earth alkali or of magnesium. This property of iron compounds in conjunction with alkaline matter has been generally used since Knublauch's process, with its many modifications, for the purpose of recovering cyanogen, especially from illuminating gas. But in neither of these processes is the cyanogen recovered in the form of uniform compounds suitable for the purposes of further manufacture; the cyanogen having only been recovered in the condition of mixtures of soluble and insoluble ferrocyanides, the insoluble ferrocyanides—necessitating a most laborious manipulation with alkali-hydrates, or earth alkali-hydrates, which,

besides requiring a very great amount of alkali-hydrates, or earth alkali-hydrates, involves a considerable loss of cyanogen. Up to the present, all attempts to recover the cyanogen in a uniform soluble condition have, he remarks, proved unsuccessful; more successful results having been obtained by recovering the cyanogen in the uniform insoluble condition. Although this, and similar processes, may be considered an improvement on the older methods, they still present the disadvantage that, before further treatment can be accomplished, the insoluble ferrocyanogen compounds have to be treated with alkalies to convert them to the soluble condition. The process according to the present invention, therefore, has for its object to enable the cyanogen to be obtained in the condition of a uniform ferrocyanogen compound, practically entirely soluble in water.

It is known that the spent oxide obtained on the purification of coal gas with oxide of iron has absorbed from the gas cyanogen and sulphur, and that the cyanogen in the spent oxide is in the condition of insoluble prussian blue. Notwithstanding this, the opinion has been expressed that cyanogen will not be absorbed by oxide of iron; but this opinion leaves unexplained how it is that prussian blue is formed in the spent oxide.

The process according to the present invention is of especial importance as applied to the obtaining of cyanogen from coal gas. The proportion of sulphuretted hydrogen is here about ten times that of the cyanogen compounds; and the general opinion hitherto has been that the ferric oxide alone, or mixed with alkalies, would be reduced partly to ferrous oxide and partly converted into iron sulphide by the sulphuretted hydrogen, and that these iron compounds, and not the ferric oxide, absorb the cyanogen.

Considering that prussian blue is the ferric compound of the ferrocyanide, the patentee says he has found, contrary to the general opinion, that the ferric oxide in the presence of ferrous oxide, or of iron sulphide, is able to absorb hydrocyanic acid and to replace alkali in the absorbing process. Hitherto only substances containing ferric oxide have been used, either alone or mixed with alkaline substances, for the absorption of cyanogen from gases. Even although the iron compounds which are used as the means for the absorption of cyanogen may be precipitated from soluble ferrous compounds, the precipitate is a mixture of ferrous oxide and ferric oxide, owing to the oxidizing influence of the air in the process of precipitation.

In consequence of the influence of the hydrocyanic acid in the gases upon matters which contain ferric oxide, in addition to the ferrous oxide, prussian blue must be formed, even in the presence of alkalies, until the ferric oxide present is reduced by the sulphuretted hydrogen contained in the gases. Sulphuretted hydrogen, however, does not act upon the prussian blue which is already formed. The following reactions will, it is said, explain the described process:—

1.—If ferric oxide only be used:—

a.—$3\ Fe_2O_3 + 3\ H_2S = 6\ FeO + 3\ H_2O + 3\ S$

b.—$36\ HCN + 6\ FeO + 4\ Fe_2O_3 = 2\ Fe_7(CN)_{18} + 18\ H_2O$

$36\ HCN + 7\ Fe_2O_3 + 3\ H_2S = 2\ Fe_7(CN)_{18} + 21\ H_2O + 3\ S$

2.—If a mixture of ferric oxide with an alkali be used:—

a.—$2\ Fe_2O_3 + 2\ H_2S = 4\ FeO + 2\ H_2O + 2\ S$

b.—$18\ HCN + 3\ FeO + 2\ Fe_2O_3 = Fe_7(CN)_{18} + 9\ H_2O$

c.—$6\ HCN + FeO + 2Na_2CO_3 = Na_4\ Fe(CN)_6 + 3\ H_2O + 2\ CO_2$

$24\ HCN + 2\ Na_2CO_3 + 4\ Fe_2O_3 + 2\ H_2S =$

$Na_4Fe(CN)_6 + Fe_7(CN)_{18} + 14\ H_2O + 2\ S + 2\ CO_2$

According to the proportion of sulphuretted hydrogen to hydrocyanic acid in the gases, more or less prussian blue will be formed. If the oxide of iron used be prepared by precipitation with a hydrate or a carbonate of an alkali, or of an earth alkali from a ferrous salt, the precipitate is ferrous oxide, mixed with ferric oxide; and therefore, on treating the gases with this mixture, there will be formed less insoluble cyanogen compounds than if pure ferric oxide were used. But even in this case, the proportion is about 20 per cent. of insoluble cyanogen compounds to 80 per cent. of soluble cyanogen compounds. Even an excess of alkali does not prevent the formation of prussian blue; the alkali combining with carbonic acid, and with sulphuretted hydrogen, before the cyanogen has time to act fully in the formation of soluble ferrocyanide. Neither the carbonate nor the alkaline sulphide can prevent the formation of prussian blue.

According to this invention, the whole of the cyanogen in the gases is recovered in the condition of soluble ferrocyanogen compounds, free from insoluble cyanogen compounds, if care be taken to exclude ferric compounds from the mixture of iron compounds with alkaline matter when this mixture is used for the absorption of the cyanogen from the gases.

The process may be carried out in various ways, according to whether it be desired to heat the gases with the mixture of iron compounds with alkaline matter by a dry or wet process. In every case, the proportion in the mixture of iron to alkali must be such that one diatomic equivalent of iron and four mon-atomic equivalents (or correspondingly fewer multi-atomic equivalents) of the alkaline matter are used. An excess of alkali is not objectionable; but a deficiency of alkali causes the formation of insoluble ferrous cyanogen compounds—such as prussian white—as well as the soluble ferrocyanide.

In carrying out the process, lime mixed with the aforesaid iron compounds is presumed to be used; but other substances than lime may be employed—such as calcium carbonate, hydrate, or sulphide, and also the hydrates, oxides, sulphides, or carbonates of the alkalies, or of the earth alkalies, or of magnesium ammonium, or aluminium. If the gas is to be treated by the wet process, the simplest way is to introduce a solution of ferrous salt (such as ferrous sulphate) into the gas-scrubber which is already full of gas. In using calcium hydrate, it can be employed in the form of milk of lime. The proportion of lime added to the solution of ferrous salt must (provided the ferrous solution contains no free acid) at least amount to three molecular proportions of lime to one molecular proportion of ferrous compounds, as, of course, the soluble ferrous salt must be decomposed; and, after this, there must still remain two molecular proportions of lime for the formation of soluble calcium ferrocyanide. If in the operation air be excluded, so that its oxidizing influence is not exercised, the scrubber will contain (besides the neutral lime salt) two molecular proportions of lime and one molecular proportion of ferrous oxide free from ferric oxide. The gas which is to be purified is then conducted through the scrubbers containing this liquid, whereby all the cyanogen is absorbed from the gas and converted into soluble calcium ferrocyanide. In order to facilitate continuous working, it is desirable to employ two or more scrubbers in series.

The reactions which occur in the scrubbers are as follows:—

1.—$FeSO_4 + 3\ CaO = FeO + 2\ CaO + CaSO_4$.

2.—$6\ HCN + FeO + 2\ CaO = Ca_2Fe\ (CN)_6 + 3\ H_2O$.

The lime, or milk of lime, may be first put into the scrubber, and the ferrous salt be run in. In cases where it is desired to precipitate the ferrous oxide before putting it into the scrubber or scrubbers, the precipitate is not so liable to be oxidized if it be produced by the agency of insoluble alkaline matter (such as carbonate, hydrate, or sulphide of lime, or of magnesia) as it is when obtained by soluble alkaline matters (such as sodium carbonate), particularly when an excess of insoluble alkaline matter is employed.

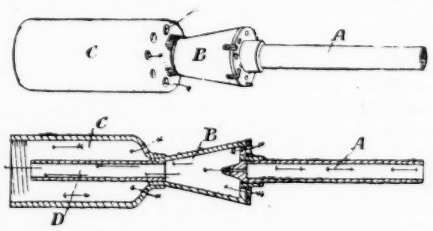
If solutions of ferric salts are to be used, they must be reduced first to ferrous salts, which can be done by means of the sulphuretted hydrogen of gas which has already been freed from cyanogen. As soon as the reduction is finished, the lime is added. Equally well a mixture of lime and ferric oxide suspended in water can be subjected to the action of reducing gases which are free from cyanogen before the gas which is to be freed from cyanogen is washed therewith. If the lime should absorb sulphuretted hydrogen or carbonic acid during the process, this will not prevent the ultimate absorption of cyanogen and the formation of soluble calcium ferrocyanide.

If the gases are to be treated by the dry process, an intimate mixture of ferrous oxide and lime is prepared—say, by precipitating a ferrous salt with lime, which mixture is placed in the purifier or absorber. It is advantageous to use two or more purifiers in series. Should the mixture contain any considerable amount of ferric compounds, it must be subjected to the action of reducing gases, as already explained, before it is allowed to act upon the gases which contain the cyanogen. When all ferric compounds have been reduced to ferrous compounds, the mixture is used for the absorption of the cyanogen. The process is the same if a mixture of mineral ferric oxide and lime be used.

The production of iron sulphide does not interfere with the formation of the soluble ferrocyanide—indeed, sulphide of iron may be used instead of ferrous or ferric oxide if care be taken that the sulphide is free from ferric oxide before it is used for the absorption of the cyanogen.

Gas and Air Mixers for Incandescent Burners, Gas-Stoves, and the Like.—Archer, D. J., of Toronto, Canada. No. 17,154; Aug. 2, 1902.

The object of this invention is to design a device to be used in connection with gas-stoves, and ordinary incandescent mantles for illuminating purposes, consisting essentially of a mixing-chamber, which holds the gas-conduit; an air-chamber separated from the mixing-chamber but connected thereto; a mixing-conduit extending from the discharge end of the mixing-chamber into the air-chamber; and other details of construction, as shown in the engraving.



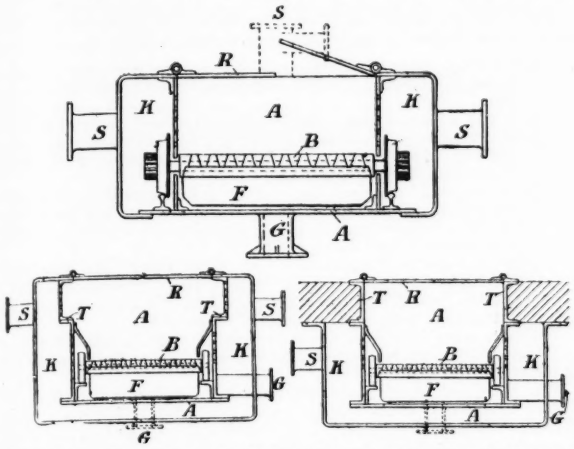
A is the conduit by means of which the gas is fed into the mixing-chamber B. The inner end of A extends a sufficient distance into the chamber B to introduce the gas well into it through the small passage-way shown, so that there will be no possibility of the gas escaping from the series of air-holes in the end of B, which is preferably tapered as shown, to facilitate the delivery of air and gas therefrom. C is the air-chamber, which preferably screws over the reduced end of the chamber B; while, extending within C, and fixed in the end of the mixing-chamber B, is the mixing-conduit D. This is of uniform diameter throughout, and of the same size as the tapered end of the chamber B.

Hot-Coke Conveyors.—Graham, Maurice, of Leeds. No. 4237; Feb. 23, 1903.

This invention—mainly for use in conveying hot coke direct from the retorts in gas-works—is a further improvement on the apparatus described in patents No. 11,979 of 1900, and No. 1560 of 1893, with the object of constructing a conveyor in which the steam, fumes, and smoke, produced by the hot coke during its transit along the conveyor trough, may be extracted by means of exhaust or pressure, and be conducted away to the chimney or some other point of discharge, and in which also the coke may be dried during its transit along the trough after the quenching operation.

The conveyor proper is enclosed (either wholly or in part) within an outer casing K, so as to form a steam-tight trough. A is the inner conveyor trough (of any convenient section), either built-up or cast solid, and provided with hinged covers R. B is the perforated grid forming the conveyor, which is hinged or jointed at regular intervals and mounted on runners or wheels at the joints, or else supported at intervals on fixed rollers, or arranged to slide or travel in any convenient manner upon continuous bearings. Thus the runners or wheels

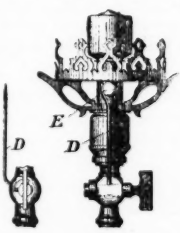
may travel upon an internal or an external rail; the conveyor B being, however, in all cases arranged at a sufficient height above the floor of the trough. The conveyor carries scrapers F for keeping the lower part of the trough clear of refuse, which is discharged (along with the waste water) by outlets G provided at intervals in the bottom or side of



the trough. The outer casing K may be attached direct to the top and bottom of the trough, or supported from channels T at the top. Or it may be built-up so as to be entirely independent of the coke-conveyor trough, and be mounted so as to enclose the whole or a portion of the trough. For instance, the outer casing K may be supported from the staging or other support upon which the conveyor is carried. The sides of the trough and channels T are suitably perforated so as to connect with the outer casing, and steam outlets S are provided at the sides, bottom, end, or in any convenient position in the outer casing, or in the top or end of the trough, by which outlets S the steam, fumes, and smoke may be extracted by exhaust or pressure—produced either by the natural draught of the chimney or by a blower, exhauster, or fan provided for the purpose.

Self-Lighting Device for Gas-Burners.—Clauss, H., of Fulda, and Schmandt, W., of Birstein by Wächtersbach, Germany. No. 3243; Feb. 11, 1903.

The patentees propose to place the ignition-pellet they use upon an auxiliary or bye-pass pipe, specially arranged to carry it, and fixed outside of and below the burner. By a suitably constructed valve, the gas is made to flow through the main and the auxiliary pipes in such a manner that, as soon as the ignition-pellet becomes sufficiently hot, the gas flowing from the auxiliary pipe carrying the pellet is ignited, and the ignited gas then lights the gas issuing from the main pipe. When this has been done, the flame on the auxiliary pipe is extinguished by turning the valve.



The burner is provided with a valve whose valve casing has a bye-pass pipe D, with its upper end forked so as to hold the pellet E. The plug of the valve has a branch leading off the main passage for supplying gas to the auxiliary pipe D. When the burner is to be lighted, the plug is turned so that the gas flows through the main passage and up through the burner, as well as through the bye-pass pipe D, to the ignition-pellet, and when the pellet becomes incandescent, it ignites the gas issuing from pipe D. A long pilot flame then rises upwards and sets light to the gas issuing from the burner. The plug is now turned so that no more gas will pass through the pipe D. The pilot-flame is thus extinguished, and the ignition-pellet can cool down. Its life is therefore very considerably prolonged, especially as it is not affected by the products of combustion from the burner.

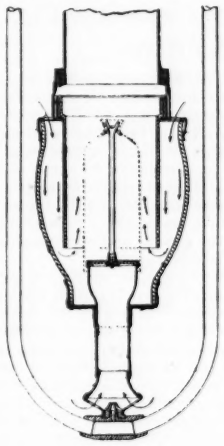
Incandescent Gas-Lamps.—Lorenz, L., of Berlin. No. 5800; March 12, 1903.

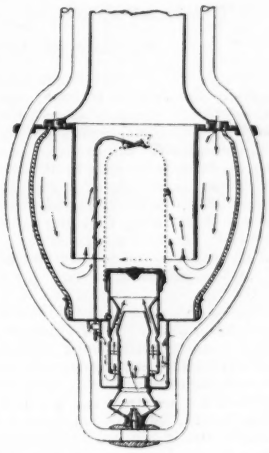
This invention relates to incandescent lamps in which "the flame is caused to develop a higher illuminating power by means of a special mixture of air and gas and an increased movement of the jets of air and gas." The improvement consists in the peculiar arrangement and formation of the chimney employed in such lamps.

The part of the chimney surrounding the mantle is placed in a gallery (as shown), which rests on a cylinder, and has a support over which a socket engages that is movably suspended on the upper solid part of the chimney, in order to connect the two parts of the chimney tightly with one another, and to enable the lower part, and also the cylinder, to be easily removed for cleaning and changing the mantles.

In the second form of construction shown, the burner is provided with two separate superimposed mixing-chambers of a diameter considerably larger than that of the gas-supply pipe. The lower chamber is in the form of a nozzle projecting by its tapering upper part into the upper chamber, but leaving an interval between the walls of the two chambers.

Both chambers are surrounded by a downwardly extending and preferably closed casing. The annular chamber thus formed is divided longitudinally by a cylindrical insertion, so that the air entering into the outer casing must flow downwards in the direction indicated by the arrow; being thereby warmed on the heated surfaces, and then only conveyed upwards into the second mixing-chamber from beneath along the inner side.





Beneath the burner gauze of the upper chamber a distributing cone is arranged in the ordinary manner. A cylinder is suspended below the chimney of the lamp, and its lower edge is in proximity to the upper edge of the burner, and forms an annular chamber between the cylinder and the glass casing or globe enclosing the lamp externally.

Outside the suspension point of the cylinder, between the latter and the glass casing, air entering into the annular space is drawn downwards by the draught in the chimney over the suspended cylinder—becoming warmed thereby, and being then drawn strongly in an oblique direction against the mantle. This air current may be regulated according to the size of the burner and the intensity of the illumination to be produced. At its entrance into the lamp, and also at the edge of the burner, the direction of the air current may be varied, and in certain cases the edge of the burner may be capable of adjustment higher or lower relatively to the edge of the cylinder. By this arrangement, "such a quantity of air can be conveyed to the flame as is necessary for developing the greatest amount of light, while fully utilizing the draught of the chimney in the air supply through the burner necessary for producing a gas-flame under pressure."

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10,770.—Meininghaus, E., "A mode of conveying heating and lighting gas." May 12.
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10,852.—Grundy, F. B., "Manufacture of incandescent mantles." May 13.
10,886.—Little, A. J. S. B., "Feeding appliances for inclined gas-retorts." May 13.
10,931.—Green, W. O., "Gas cooking-ranges." May 13.
10,960.—Leslie, J. A., "Incandescent gas-burners." May 14.
10,974.—Kronheim, W., and Haltenhoff, O., "Igniting device for gas-lamps." May 14.
10,987.—Clark, P. B. & C. H., "Connection for use with gas-fittings." May 14.
10,996.—Frankl, R., Weiss, L., and Ziegler, F., "Burners." May 14.
11,023.—Goodwin, W., "Gas-lamps." May 14.
11,054.—Eastwood, C., "Gas-producers." May 14.
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11,103.—Gibbons, W. P. & G. B. A., and M'Ewen, C. J., "Preventing the choking of ascension-pipes." May 15.
11,104.—Gibbons, W. P. & G. B. A., and Ogden, S. R., "Regenerative furnaces of inclined gas-retorts." May 15.
11,180.—Little, A. J. S. B., "Hot-coke conveyors." May 16.
11,208.—Scotti, K., "Fluid meters." May 16.
11,252.—Wright, G. E., and Sutherland, A. G., "Recording cash-boxes, collecting-boxes, and the like." May 18.
11,354.—Hills, H. G., "Manufacturing gas from carbonaceous material." May 19.
11,356.—O'Connor, H., and Milne, J., "Dry meters." May 19.
11,358.—Little, A. J. S. B., "Conveyors." May 19.
11,367.—Schwab, M. C., "Conveyors." May 19.
11,421.—Melhuish, A. G., "Gas or oil engines." May 19.
11,433.—Quick, J., and Fallon, J., "Atmospheric gas cooking-stoves." May 19.
11,499.—Nicholson, R. E., and West, H., "Cleaner for retorts or the like." May 20.
11,561.—Lion, G. P. J., "Carburetting air by means of naphthalene." May 21.
11,567.—Davis, E., "Bunsen gas-heating apparatus." May 21.
11,577.—Pratt, W., "Supporting inverted incandescent gas-burners." May 21.
11,662.—Kelly, J. H., "Gas-fittings." May 22.
11,750.—Holmes, E. D., "Treating coal gas to prevent loss of illuminants." A communication from O. N. Guldlin. May 22.
11,751.—Muylwyk, P. D., "Igniting street-lamps." May 22.
11,789.—Marshall, H., Stuart, G. M., Maton, J., and Weir, F., "Burning carburetted air." May 23.
11,790.—Thomson, R., "Gas and oil engines." May 23.
11,827.—Lake, H. H., "Producing mixtures of gas and air." A communication from Selas Gesellschaft m. b. H. May 23.

CORRESPONDENCE.

[We are not responsible for opinions expressed by Correspondents.]

Sulphate of Ammonia as a Manure.

SIR,—The "Report upon Experiments with Sulphate of Ammonia during the Season of 1901," published by the Sulphate of Ammonia Committee, presents some interesting features, many of which are worth more than passing notice. It is superfluous to criticize all the figures quoted; but many of the salient points should be appropriated by all manufacturers of sulphate who wish to emphasize its value as a manure. The improved market price of sulphate is probably responsible for the present lack of interest in the subject. Hence the desirability of knowing its value for manurial purposes is likely to be overlooked. A careful perusal of the whole of the figures and experiments is desirable to thoroughly appreciate the position.

In former letters to the "JOURNAL" upon this subject (on Feb. 8 and July 19, 1898), I drew attention to the splendid efforts being made by the Sulphate of Ammonia Committee, and more particularly by the energetic Chairman (Mr. William G. Blagden) and Colonel S. A. Sadler, M.P., of Middlesbrough, who during the intervening four years have not relaxed their energies to demonstrate the value of sulphate for manurial purposes. On more than one occasion, I have advocated the advertising of sulphate under a new name, such as "Nhitros;" but this suggestion has not met with any sympathy, though I am convinced that some abbreviated title would be found preferable to the longer one now used. The undoubted utility of the organization of sulphate manufacturers has been fully proved; and it is certainly reasonable to anticipate that those makers who have not already joined the Committee should do so, and thereby strengthen the position very materially. The work of popularizing sulphate for home agriculture has only commenced; while practically nothing has yet been accomplished in Ireland. The Committee's stand at the Cork Exhibition was an attempt to touch the fringe of the business; the position in Ireland being a difficult one. Continuous advertising and experiments are necessary to ensure the desired result—viz., the proof of the economy of using sulphate at home in preference to exporting it and importing chemical manures of inferior value.

Reviewing the experiments during the season 1901, the report states that "there has not been the slightest suggestion of disappointment anywhere," which is forcibly borne out by the large increase in the number and nature of inquiries. It is satisfactory also to note the confirmation of one's knowledge that it must now be accepted as an established fact that no other manure of its class can compare with sulphate in the great weight of crop, coupled with the excellent quantity and conspicuously good keeping properties. Reverting to the report, the following particulars may be gleaned.

Yellow Turnips.—The two farmers' clubs set forth showed an increased yield of about 34 per cent. by the use of sulphate.

Swedes.—The three clubs showed an average increase of 26 per cent. of swedes by using sulphate.

Mangels.—The average increased weight was about 30 per cent.

Late Potatoes.—It is sufficient to cull that only one crop yielded less than 12 tons per acre.

It is undesirable to review all the classes of experiments; the foregoing being a few illustrations from a mass of excellent results set forth in the report and statement, which deserve full consideration both by manufacturers of sulphate of ammonia and British agriculturists.

EDWARD A. HARMAN.

Huddersfield, May 28, 1903.

The Lowering of the Lighting Standard.

SIR,—Now that Sir George Livesey has obtained his Bill permitting the lowering of the lighting standard, it will probably not be long before all gas lighting companies reduce their standard even to the degree of 10 to 12 candles. If I am not mistaken, this radical change was originally suggested in your columns over ten years ago. No doubt, it would have been equally advantageous at that time as now; and it would certainly have checked the development of electric light, popularized gas for cooking, and made the rivalry of cheap and calorifically poor producer gas an impossibility. But it is a common feature in this country that improvements arrive too late to secure all their intrinsic value.

D. H. DYSON.

13, *Craster Road, Brixton Hill, S.W., May 28, 1903.*

Ten Years' Work at Stourbridge.—In the report presented by the Gas Committee at the last monthly meeting of the Stourbridge District Council, details were given of the progress of the undertaking in the ten years which have elapsed since its acquisition by the Council. The quantity of gas sold has increased from 81,879,400 cubic feet to 166,000,600 cubic feet last year, and the total income from £15,396 to £30,806. The gross profit in the ten years has amounted to £80,325. Last year's net profit came to £2058; and half of this is to go to the relief of the rates.

Staffordshire Potteries Water-Works Company.—The report which was adopted at the meeting of the Staffordshire Potteries Water-Works Company last week stated that the water revenue for the year was £52,236, as against £51,090 for 1902—showing an increase of £1146. The profit on revenue account amounted to £25,256, which, with the balance of £566 brought forward from the last account, made a total of £25,822. After providing for the interim dividend paid in December last, there remained a balance of £13,422. The Directors recommended the payment of a dividend at the rate of 8½ per cent. per annum on the consolidated ordinary stock, and 7 per cent. per annum on the consolidated new ordinary stock—leaving £896 to be carried forward. The report was adopted.

PARLIAMENTARY INTELLIGENCE.

HOUSE OF LORDS.

The following further progress was made with Bills down to the rising of the House for the Whitsuntide holidays:—

Bill brough from the Commons, read the first time, and referred to the Examiners: Local Government Provisional Orders (Gas) Bill.

Bill read a second time: Gas and Water Orders Confirmation Bill.

Bills read a second time and committed: Gorleston and Southtown Gas Bill, Hyde Corporation Bill, Nelson Corporation Bill, New Hunstanton Improvement Bill.

Bills reported: Burgess Hill and St. John's Common Gas Bill, Market Drayton Gas Bill, North-Western Electricity and Power Gas Bill, Scarborough Gas Bill, Sittingbourne District Gas Bill, Winchester Water and Gas Bill.

Bills read the third time and passed: Bridgwater Gas Bill, British Gas Light Company (Norwich) Bill, Chard Corporation Gas and Electricity Bill, North Middlesex Gas Bill, Sutton District Water Bill, Torquay Corporation Water Bill.

A Bill to amend the Acts relating to electric lighting was brought in on Tuesday by Lord Wolverton, read the first time, and referred to the Examiners.

The Bury and District Joint Water Board Bill has been referred to a Select Committee, consisting of Lord Hatherton (Chairman), Earl Lytton, Viscount Hutchinson, Lord Belhaven and Stenton, and Lord Crawshaw; to meet on the 15th inst.

HOUSE OF COMMONS.

The following further progress has been made with Bills down to the rising of the House for the Whitsuntide holidays:—

Bills brought from the Lords, read the first time, and referred to the Examiners: British Gas Light Company (Norwich) Bill, Chard Corporation Gas and Electricity Bill, Torquay Corporation Water Bill.

Bill read a second time and committed: Rickmansworth Gas Bill [Lords].

Bills reported: Harrow and Stanmore Gas Bill [Lords], Merthyr Tydfil Urban District Council Bill, Wellington (Salop) Gas Bill [Lords].

Bills read the third time and passed: Faversham Gas Bill [Lords], Local Government Provisional Orders (Gas) Bill, Plymouth and Stonehouse Gas Bill [Lords].

GLEANINGS FROM THE COMMITTEE ROOM.

THE lobbies were almost deserted at the beginning of last week; and by midday Wednesday only one Commons Committee was sitting. The Lower House rose on Thursday night; and business will not be resumed until next Monday. So far as Committee proceedings are concerned, the heaviest work of the session has been accomplished; and altogether things are in a much more forward state than usual.

Tramways, Gas-Mains, and other Matters. In the gains of the South Shields Gas Company as the result of their opposition to the Corporation Bill, which proposes, *inter alia*, to confer powers upon them in regard to the laying and working of electric tramways, the greatest interest of the week lay. The proceedings on this and a companion Bill promoted by the British Electric Traction Company occasioned the sitting of Colonel Bowles' Committee on no less than five days; and what publicly transpired is sketched elsewhere. Here, however, it may be useful if more direct prominence is given to the successes of the Gas Company; and in this we have been kindly assisted by notes supplied by Mr. T. H. Duxbury, the Company's Engineer. The first point of importance has reference to the alterations of gas-mains and pipes for tramways construction. Occasionally, the following clause has been inserted in Tramways Acts by agreement; but in this case Colonel Bowles' Committee have granted its insertion on the Gas Company's representation. The clause reads:—

> If within fourteen days after receiving notice from the Corporation of their intention to lay down any tramway by this Act authorized in any road in which any mains or pipes for the supply of gas belonging to the South Shields Gas Company are situated, the South Shields Gas Company give to the Corporation notice in writing of their desire themselves to execute any alterations of the said mains or pipes which may be necessary, the Company shall be entitled themselves to execute such alterations. Provided always that such alterations shall be forthwith carried out with all reasonable despatch, and the reasonable cost of executing such alterations shall be repaid by the Corporation to the South Shields Gas Company.

In connection with the alteration of gas mains and pipes for street works, the Bill included a protective clause for the Water Company similar to one obtained by them in the South Shields Corporation Act, 1900, when the Gas Company did not oppose, and therefore did not obtain the same protection. The clause is now to apply to the Gas Company as well as to the Water Company; and it gives them power to alter or remove any pipes themselves—the Corporation paying all costs incurred. As to the construction of tramways in narrow streets, one of the streets of South Shields where it is proposed to construct a double track of tramrails is only 23 ft. 5 in. wide; and as the over-all width of the tramrails is 12 ft. 11½ in., the clearance would be but 5 ft. 2¾ in. on each side. This, however, would not leave room for vehicular

traffic on either side when two cars were passing; and so the rails were shown on the deposited plans towards one side of the road—leaving only 12¾ inches between the outer rail and the kerb, and 9 ft. 4¾ in. on the other side. There are two gas-mains already in the road, and one of them would have to remain under the rails. The Gas Company suggested a single track or interlacing lines; thus leaving a suitable position for the main to be transferred to. The Commons Committee have partially met the Company in this matter by inserting the following clause:—

> Provided that the Corporation shall not construct that part of Tramways (No. 6) along Hudson Street except in accordance with plans to be first submitted and approved by the Board of Trade.

This is only a small point; but inasmuch as the Company's *locus standi* was refused by the Court of Referees for the Sunderland and South Shields District Tramways Bill quite recently, Mr. Duxbury was anxious to test the "feeling" of the Committee on this narrow road question, and, in doing so, submitted plans showing the proposed positions of the rails and kerbs. Part 5 of the Bill referred to electrical supply, and it comprised five clauses proposing: (*a*) Power to use lands; (*b*) power to supply electrical apparatus; (*c*) bye-laws with respect to electric fittings; (*d*) power to supply electrical energy in bulk outside the borough boundary (but within the Gas Company's area of supply); and (*e*) power to supply electricity for traction purposes to companies partly within and partly outside the borough. The Gas Company petitioned against all the foregoing, using primarily as a weapon the fact that free electricity had been given to new consumers for three months during last year, and that these further powers were sought on the security of the rates, to which the Company are large contributors. In the result only one of the five clauses was allowed—viz., the first—all the others having been struck out, including the power to supply electric apparatus. The Gas Company requested the insertion of a clause which would minimize the possibility of deficiencies being met out of the rates for both the electricity department and the tramways; but all the clauses concerning electricity supply having been deleted from the Bill, the Committee inserted the following in the Tramways portion:—

> The Corporation shall once in every year, after the first year's working of the Corporation tramways, cause to be laid before them a statement and balance-sheet of the accounts of the Corporation tramways; and the Corporation shall thereupon fix annually the tolls, fares, and charges to be levied by them for the use of the tramways for the then ensuing year at such rates (not exceeding the tolls, fares, and charges authorized by this Act), so that, as far as reasonably practicable, the revenue for the year shall not be less than he expenditure for the same year.

The Company also sought to obtain the Sheffield clause *re* electrolysis; and Professor Swinburne gave evidence in support of this. The application, however, failed. The Bill promoted by the British Electric Traction Company for connecting South Shields with Sunderland by tramway was considered jointly with the Corporation Bill as both sought powers over the same route for one line of tramway, though each had other routes in addition. This Bill was thrown out by the Committee; and therefore the Gas Company (whose *locus* was refused by the Court of Referees) will not now require to petition the Lords in regard to it.

Merthyr Water-Works Extensions. Works of an extensive nature are proposed by the Merthyr Tydfil District Council in connection with their water undertaking. The Council have promoted a Bill for this and other purposes in the present session; and it was before Mr. Heywood Johnstone's Committee on Wednesday. But the water section was among the part that was unopposed; so that a very little explanation from Mr. G. F. Deacon gave satisfaction. The excellence of the scheme and its capability to meet the necessities of the district for many years to come were proved. The estimate for the new works is £102,000, of which £18,000 is to be set apart for filter-beds and certain improvements. It was proposed that the repayment of the loan for the construction of the filter-beds should extend over 60 years; but the Committee have only allowed 40 years. For the repayment of the loan for the main water-works 60 years was also asked; but the Committee have restricted the period to 50 years, so that it conforms with the period granted under the Council's Act of 1895.

Water Supply Bye-Laws in Willesden. In the "JOURNAL" last week, reference was made to the electric lighting clauses in the Bill promoted by the Willesden Urban District Council, which were opposed by the Gaslight and Coke Company. Among the other powers sought by the Council was one to make bye-laws in respect to water-closets. Clause 42 runs as follows: "The Council may make bye-laws with respect to water-closets, and may by such bye-laws prescribe the description or nature, size, materials, position, and level thereof, and of the apparatus and the manner of flushing the same, and the means to be provided for protecting the same from frost." The West Middlesex Water Company deposited a petition against the Bill on this point; and Mr. Bellewes appeared before Lord Brougham's Committee on Monday last week in support of it. The Chairman of the Council (Mr. G. A. Sexton) was called to justify the action of that body, and he was followed by Mr. Bellewes, who addressed the Committee against the insertion of the clause. He urged that if the promoters wished seriously to make alterations in the Metropolis Water Acts, it was a most undesirable course of procedure. Under the existing law, there was ample opportunity for the Local Government Board to make any change they considered necessary or expedient. He did not think the Department would alter the existing law for the benefit of Willesden; but if the Committee passed the clause, they might feel bound, as the servants of Parliament, to give effect to their decision. The Committee deliberated over the matter, and eventually decided to insert, at the end of the clause, the words "subject to the regulations of the new Water Board." This gave rise to some discussion; and it was finally agreed that the addition should read as follows: 'Provided always that any bye-laws made by the Council under this section shall be subject to any regulations made under the Metropolis Water Act, 1871, or any Act extending or amending the same."

Senseless Opposition. The little comment which was made in the "Gleanings" a fortnight since on the ridiculous opposition of Mr. Dempsey to the Belfast Water Commissioners' Bill has been reproduced in the "Belfast News Letter." The Editor appends these remarks: "This [the comment] is very severe on Mr. Dempsey; but we cannot say it is any way too strong. We understand his opposition to the Water Bill cost the Commissioners £700. Some luxuries may be purchased at too great a cost; and Mr. Dempsey, as self-constituted opponent-in-general of local applications for parliamentary powers, appears to be one of them." That £700 more than justifies the censure of Mr. Dempsey's conduct.

SOUTH SHIELDS TRAMWAYS BILL.

Protection against Municipal Trading.

At the beginning of last week, and towards the end of the previous week, a Select Committee of the House of Commons, presided over by Colonel Bowles, had before them a Bill promoted by the Corporation of South Shields, asking, among other things, for power to lay and work electric tramways, &c. Opposition was offered to this part of the Bill by the British Electric Traction Company and the South Shields Gas Company. The Corporation are already the owners of electricity works, from which it was intended to supply current for running the trams. Counsel on behalf of the Electric Traction Company (who were really the promoters of a rival scheme) having been heard, Mr. Dickinson, in the absence of Mr. Claude Baggallay, K.C., presented the case of the Gas Company. He said the Bill authorized the Corporation, through certain electric power clauses, to sell radiators and motors to consumers; but it appeared, from the examination of the Borough Electrical Engineer, that this was a very insignificant matter, and it was promptly dismissed. One strange thing was, however, brought to light—that in the summer of last year the Corporation offered to supply free current for lighting purposes for three months to all new customers who asked for it. Some 35 persons were so supplied, at a cost to the town of £11 16s. 6d. The official explanation of this strange business was that it was suggested by the Engineer, so as to make it easier to cope with the rush of work which was threatening in the autumn and winter months, to distribute the work of the department more evenly. Alderman Renoldson, the Chairman of the Electricity Department, pleaded that it was a mere experiment, perfectly defensible as a piece of competitive business. It was an advertisement—the throwing of a sprat to catch a mackerel. But he admitted that it was not very successful in its results, and that the Corporation were not likely to repeat it. There had been complaints from some of the old customers of the department that it was unfair to them. The members of the Committee seemed to be impressed by the protest of the Gas Company against this sort of competition. The Company also denounced the system of bookkeeping adopted by the Electricity Department; and Mr. Chapman, a Director of the Company, said that he calculated that if the accounts had been kept on the usual commercial basis, the department, instead of making a profit as was claimed, would have recorded a total loss of £17,000 up to the date of the last accounts. Mr. Pember cross-examined the witness very severely on his calculation, and asked him to put his finger on a single item of the accounts that had been wrongly placed under the different heads; but Mr. Chapman, without accepting this challenge in detail, maintained the general substantial accuracy of his figures, and added that he believed the Corporation must soon raise their prices for current. Another suggestion was that the Corporation electricity works were under-rated. The Corporation witnesses, however, pointed out that the assessment area was the whole of the Poor Law Union—an enormous area compared with the town of South Shields—and that the Committee who settled the figures were a most capable body, quite independent, and indeed little likely to favour the town at the expense of the country.

When the Committee rose the week before last, the case for the promoters had been concluded. The first witness on behalf of the Gas Company was Mr. T. H. Duxbury, the Engineer of the Company. He said that damage from electrolysis had appeared in certain places; and what had occurred in one place could occur in another. Such damage was not provided for in the Corporation Bill. He thought the Corporation ought, dealing directly with the Gas Company, to compensate them for any such damage. If it did not occur, the Company did not want anything. Witness, cross-examined by Mr. Lewis Coward, K.C. (for the Corporation), was asked why the Gas Company's petition against the Traction Company's Bill was so much stronger in its allegations than that against the Corporation Bill. He replied that he did not see the difference. He denied that the Company were protected by the Tramways Act; neither did the general law give them that freedom of action which was desirable. He spoke of the difficulty of removing mains, especially in narrow streets.

Mr. Baggallay, K.C. (who led for the Gas Company), opened his address with some general remarks on unfair competition. He contended that the whole of the electrical undertakings should be made to pay as a condition of the Corporation getting these further powers. It must be known to the Committee that if a local authority came to Parliament for power to establish a gas or water undertaking in competition with a private undertaking already existing, Parliament would not—and the Local Government Board, if asked to sanction any financial arrangements, would not—allow the local authority to use the rates in competing with the existing undertaking, even when the undertaking was not a statutory one. He contended that if the Committee found the preamble proved, it should be subject to the inclusion of some provision on the lines of what was known to them as the Bermondsey clause, which was aimed against unfair competition by user of the rates. As to the question of mains in narrow streets, short of widening the latter, he asked for simple or interlacing lines. He also desired to have the clause given to the Sunderland and South Shields Water Company made applicable in respect to the mains of the Gas

Company. Finally, he asked for protection against damage from electrolysis, such as was given in the Somersetshire Power Bill.

The Committee then took up the Bill of the South Shields and Sunderland District Tramways Company—otherwise the British Electric Traction Company—to authorize the construction of tramways between Sunderland and South Shields through Whitburn and Harton, and traversing the town of South Shields until it terminated opposite the tube under the Tyne connecting South and North Shields, and coupling up on the north of the river with the various tramways of the Traction Company working there and affording communication right away north as far as Newcastle. Evidence was given at great length, and there were certain agreed modifications made in the proposals. Before giving their decision, the Committee desired to hear Mr. Pember on the demands made and new clauses in the Corporation Bill by the South Shields Gas Company. Counsel, touching first on the question of electrolysis, said protection was given for the first time in 1900; and in 1901 it was given in the Sheffield case. Since then, it had been invariably refused. In the Bexley case, Sir Courtenay Boyle, being called as a witness, said electrolysis might be coming; but so far there was no proof of it, and he (Mr. Pember) hoped the Committee would not depart from settled practice unless there was some very special reason shown. Upon the question of unfair competition, the Dundee and Aberdeen cases were hardly in point. There was fear that the Councils of these towns were so much in favour of reducing the rates and fares on the tramways, that it was almost a case of full travelling; and as the railway companies protested, a protective clause was put into the Bills. The only instance worth considering where a corporation or other local authority was made to carry on their undertaking on commercial principles was, he thought, the Bermondsey case, which was to the effect that charges for supplying energy should be fixed at such rates as that the revenue for the year should not be less than the expenditure. But if the public were to be induced to take electricity, it was useless to put the price too high. The ordinary conditions of trade must be followed; and simply because a corporation were not allowed to show a loss, it would not be the slightest use to fix the charge (say) at 8d. per unit. There must, it seemed, be a loss at the outset in all electricity undertakings; and it would be futile to seek to avoid it by means which would prevent the undertaking from ever paying at all.

The Committee, having briefly consulted, without clearing the room, the Chairman said they found, as regards the Corporation Bill, that the preamble was proved, except in respect of clause 34, empowering the sale or hire (but not manufacture) of electrical apparatus. They inserted in the Bill the first part of the Dundee clause as follows: "The Treasurer of the Corporation once a year, after the first year's working, shall lay before the Corporation a statement and balance sheet on tramways account, fixing the tolls, fares, and charges to be levied so that the revenue should meet the expenditure as specified in the balance-sheet" Then there was a clause to go in binding the Corporation to get the sanction of the Board of Trade to plans before laying the lines in Hudson Street. The Committee were of opinion that the Gas Company should be empowered to move their own mains if they desired and it was necessary to move them. Finally, they were of the opinion, as regards the second Bill—that of the Tramways Company—that the preamble was not proved.

Clauses were at once drafted to meet the wishes of the Committee, and approved by them.

The Bermondsey Clause in the Willesden Bill.—In the "JOURNAL" last week we announced that the Select Committee of the House of Lords presided over by Lord Brougham and Vaux had decided, at the instance of the Gaslight and Coke Company, to insert the Bermondsey clause in the portion of the above-named Bill relating to the supply of electricity. When the clauses came up for consideration, Mr. Frere, on behalf of the Company, proposed some additional words. Mr. Greig (who with Mr. Claude Baggallay appeared for the promoters) said he was prepared to agree to the following *addendum*: "So that, so far as is reasonably practicable, the revenue for that year shall not be less than the estimated amount of the expenditure and of the charges for interest and sinking fund for that year." The Chairman said the Committee would sanction the clause, with this addition.

LEGAL INTELLIGENCE.

CLERKENWELL COUNTY COURT.—Thursday, May 28.

(*Before His Honour Judge* EDGE.)

Claim in Respect of Gas Supplied to a Public-House.

To-day, Mr. Benjamin Frederick Foster, of No. 89, Camden Street, Camden Town, was sued by the Gaslight and Coke Company for £7 4s. 4d. for gas supplied and the rental of a stove.

On behalf of the plaintiffs, it was stated that at the time the defendant incurred the debt he was licensee of the Crown public-house in St. Pancras. A change took place, and he went out without paying his gas bill. The Company lost sight of him until recently, when he made application to have gas laid on at another house. The period for which gas was owing was from March 30 till June 4, 1898.

Defendant's case was that he gave the Company notice that he was leaving the house on a certain date, and that it was to be taken over by the Cannon Brewery Company, who would be responsible for the accounts. He gave up long before June 4, 1898; but as the police raised an objection to the incoming tenant, he remained as the Manager for the Brewery Company, who, he thought, had settled all the accounts.

The plaintiffs' representative said the Brewery Company refused to pay the account because defendant left owing them money.

His HONOUR: The question is, did he give notice to your Company that he would not be responsible, and did he give such notice before the 4th of June?

The REPRESENTATIVE: He did not give notice until June 4.

The defendant urged that, as the Brewery Company paid the Queen's taxes, they ought to have paid the other accounts. When he went out of the house, they took over the liabilities, and gave him a full discharge.

His HONOUR: I think you are liable at present. If you can produce an agreement between yourself and the Brewery Company, whereby they undertook to pay this account, you can sue them—after you have paid it, of course.

Judgment was given for the plaintiffs, with costs.

A Disobedient Corporation Punished.

In the King's Bench Division of the High Court of Justice last Tuesday, before Justices Wills and Channell, the Attorney-General (with him Mr. Sutton) moved for a rule *nisi* to quash a return to a peremptory writ of *mandamus* and for an attachment against the members of the Corporation of Worcester for disobedience. The writ, which was served in 1897, directed the Corporation to obey an order of the Local Government Board by carrying out a scheme for the disposal of sewage of the city, so as to prevent its discharge into the Severn, contrary to the provisions of the Rivers Pollution Prevention Act. The return to the writ was filed April 1, 1903, and was to the effect that the Corporation were carrying out a scheme which would prevent an offence. The learned Counsel contended that this was no answer to a peremptory writ. If any members of the Corporation had done their best to obey the order, it would be another matter. The Court granted a rule *nisi*.

Action for Inducement to Violate an Agreement.

It will be remembered at the last Birmingham Winter Assizes, the Lord Chief Justice and a Jury had before them an action in which the Eveson Coal and Coke Company, Limited (also trading as the Staffordshire Tube Company, Limited), claimed damages from the Victoria Tube Company, Limited, because the latter had employed Mr. Thomas Cash to obtain orders for them while he was under agreement to devote the whole of his services to the plaintiffs, for whom he was a traveller. As was reported in the "JOURNAL" for Dec. 23 last (p. 1702), the Jury, after a short conference, returned a verdict for the plaintiffs; and his Lordship directed that the damages should be assessed by Mr. E. W. Cave, barrister. The Referee has now issued his award, in which he places the damages at the sum of £500, and orders defendants to pay the plaintiffs the costs of the action and of the reference.

Rating of the Vyrnwy Water-Works.

In the King's Bench Division of the High Court of Justice last Thursday, the Lord Chief Justice and Mr. Justice Channell heard an appeal on behalf of the Mayor and Corporation of Liverpool, by way of a special case, from the decision of the Justices of the Peace for Montgomeryshire. At Petty Sessions at Llanfyllin, on Nov. 26, 1902, a civil debt summons, issued at the instance of Messrs. Jones and Gittens, Overseers of the parish of Llanwddyn, against the Mayor and Corporation, summoning them to answer the respondents' claim for £667 odd, being arrears of poor-rate alleged to be due to them from the appellants in respect of their water-works at Lake Vyrnwy, was remitted to them to be reheard; and they determined that a warrant of distress should issue for the recovery of £275 odd, with £60 costs. The special case set out a complicated set of facts at great length, and raised a number of points. There was a cross appeal on behalf of the respondents, who claimed to be entitled to £667 odd. After considerable discussion, the case was settled by both appeals being dismissed, with costs; the order of the Petty Sessions for £275 and £60 costs to stand by consent.

A Dishonest Gas-Fitter.

At the West London Police Court, on Monday, May 18, George Ferris, 21, a fitter in the service of the Gaslight and Coke Company, was charged with stealing a sovereign belonging to Miss Jackson, the secretary of the Kensington branch of the Charity Organization Society, of Upper Phillimore Place. Miss Jackson stated that, money having been stolen on two previous occasions when the prisoner had called at the house to examine the gas-fittings, she caused a sovereign to be marked, and it was left on her desk with other coins. The man duly made his visit of inspection, and, the sovereign being missed, he was taxed with the theft. He confessed his guilt, and produced the coin from his pocket. Ferris asked to be dealt with under the First Offenders' Act; and he was sentenced to one month's hard labour.

The Appeal in the Cannon Brewery Case.—Last Tuesday the appeal of the defendants in the case of the *Gaslight and Coke Company v. Cannon Brewery Company* from the judgment of the Court of Appeal given in favour of the Company on the 6th of March last, as reported in the "JOURNAL" at the time, was presented to the House of Lords; and the respondents were ordered to lodge a printed answer thereto on or before the 7th prox.

Gas Testing on Sundays.—As the outcome of the recent proceedings in the above-named matter before Mr. Justice Joyce (*ante*, p. 384), the London County Council gave notice to the South Metropolitan Gas Company that the Council's examiners would attend at the testing-places to test the Company's gas on and after Sunday, the 24th ult.

MISCELLANEOUS NEWS.

PARIS GAS SUPPLY.

The Competition for the New Concession—The American Scheme Discountenanced.

When the subject of the gas supply of Paris was last referred to in the "JOURNAL" (*ante*, p. 98), the proceedings in connection with the inquiry by the Gas Committee of the Municipal Council into the several proposals submitted to them for continuing the service on the termination of the existing concession on Dec. 31, 1905, had reached the stage that the scheme sent in by the Gas Company had been rejected, and that put forward in the names of MM. Devaluez and Duchanoy, but in reality promoted by a group of American capitalists, recommended for adoption. It seemed, therefore, that the Americans would be successful in capturing the concession; but we pointed out at the time that it would not do to rely too confidently upon it. There were two important factors to be reckoned with—the Prefect of the Seine and the Municipal Council. A Sub-Committee might recommend and the full Committee approve; but it would not necessarily follow that their views would be shared by the majority of their colleagues in the full Council. As the gas question appeared to have been practically disposed of by the Committee, some impatience was manifested in the Council at no definite news being forthcoming in regard to it; and at the opening meeting of the new session on the 6th ult., M. Joseph Weber asked the Prefect of the Seine what was the position of affairs. But this wary official was not to be drawn. He reminded the worthy member that the Council had referred the question to a Special Committee; and he advised him to address his inquiry to them. He added that, so far as he was personally concerned, he was quite willing to give the Council his opinion on the matter; but before doing so he should like to know what the Sub-Committee had really decided. This remark evoked exclamations of surprise that the business was not finally settled, so far as the Committee were concerned. A report was circulated to the effect that the guarantee to be given by the Americans had been reduced from 75 to 40 million francs; but nothing definite was known.

All this looked like temporizing; and Socialist and Radical members of the Council did not like it. So they determined to endeavour to get clear and precise information as to the reasons which induced the Committee to accept the offer of foreigners in preference to those submitted by persons of their own nationality. Meetings were accordingly held at the Hôtel de Ville on the 8th ult., with the result that a rumour very soon ran through the lobbies that the American scheme had been thrown over. It was explained by M. Chautard, the reporter, that the Sub-Committee had confined themselves to the study of the one scheme in all its bearings, and had drawn up a kind of typical Treaty as complete as possible. They had learnt indirectly, however, that proposals analogous to those made by MM. Devaluez and Duchanoy had been submitted to the Prefect of the Seine. According to what appeared at the time in the Paris papers, the actual fact was that identical conditions to those proposed by the Americans to the Sub-Committee had been sent by a Parisian company to the Prefect, and that he was actually in possession of a complete scheme! As the Sub-Committee had not finished their work, he was not called upon to express any opinion upon it, or to "show his hand." But it was pretty confidently expected that, when the discussion of the question came on in the Municipal Council, he would disclose the nature of the propositions made to him. This turn of affairs was the subject of much conversation in the corridors of the Hôtel de Ville; and the most determined supporters of the American scheme were the first to recognize that, inasmuch as several precisely similar projects were in evidence, there was no special reason why one should be adopted in preference to another. It was therefore thought probable that the majority of the Council would decide to approve of the Treaty drawn up by the Sub-Committee, and use it as the basis of a contract for which, under the customary guarantees, all parties would be able to compete.

The Sub-Committee eventually brought their arduous labours to a close; and on the morning of the 19th ult. the text of the suggested Treaty, accompanied by the conditions under which it would be granted, was distributed to the members of the Municipal Council. It is a long document; but its principal provisions may be briefly stated as follows: It is proposed to lease to a farming company, for a period of 35 years, from Jan. 1, 1906, but terminable without compensation at the expiration of 20 years, the works and plant required for the manufacture and distribution of gas in Paris and the suburbs. The concessionary company will be at liberty to construct new works or to purchase those in existence; but in either case the City will immediately become the owners of them. The company will also have to repay the amount expended in reducing the price of gas from 30 c. to 20 c. per cubic metre in the last three years of the current concession, as well as the outlay necessary for placing the staff during that period upon an equality with the municipal staff. All charges incurred in respect of the period anterior to 1906 are to be put into a separate account, and liquidated by a special sinking fund. The price of gas to private consumers is to be 20 c. per cubic metre for the first eight years of the term of the lease, and 15 c. afterwards, or, alternatively, 16·5 c. for the entire period. The charge may be lowered on special conditions for certain classes of consumers carrying on the same trade or making a similar use of gas. For municipal purposes the price will be 15 c. The company are to pay to the Municipality a duty of 3·75 c. per cubic metre on all the gas sold. But the total annual amount of this duty is not to be less than 17 million francs. When the annual return on the share capital is more than 12 per cent., the excess is to be divided between the City and the shareholders, in the proportion of 60 per cent. to the former and 40 per cent. to the latter. The share capital is to be 50 million francs; and no bonds are to be issued until all the shares are liberated. Bonds to the amount of 200 million francs may be issued as required; those for meeting the charges anterior to 1906 to be paid off in eight years, and the rest before Dec. 31, 1940. For the purposes of the division with the City, the bond interest and sinking fund are to be calculated at the rate of 3½ per cent., whatever may have been the issue price. The company is to be constituted in accordance with French law; the Board is to be composed of Frenchmen; and the General Manager, who is also to be French, is to be approved of by the Prefect of the Seine. As soon as possible after the announcement by the Municipality of the acceptance of the tender, the company must pay into the Municipal Exchequer security to the amount of 10 million francs, and a further 20 million francs within two months; but the latter amount may be replaced by a guarantee of a French credit establishment approved of by the Prefect.

The conditions accompanying the Treaty contain (*inter alia*) regulations in regard to the *octroi* duties in connection with the works, the kind of gas to be supplied—which is to be "coal gas unmixed with water gas, except by special permission"—the lighting of the public thoroughfares, and the supply of gas to private consumers. On the last-named point, some changes are to be made in the existing *régime*. Deposits are to be at the rate of 2 frs. 50 c. per 100 litres hourly output of the meter; the rent of meters and fittings is to be considerably reduced; and lodgers whose rent does not exceed 500 frs. per annum will not have to make any deposit or pay for either meter or fittings. In the last case, however, the consumer will have to guarantee payment for gas to an amount equal to the deposit he would have had to make under the ordinary conditions of supply, unless he uses a prepayment meter.

The foregoing are the principal points in the Treaty of the Sub-Committee, which was left for the municipal councillors to ponder over before being called together to deal with it early this month. But in the meantime, a surprise was in store for them. The full Committee had a meeting on the 22nd ult., at which the Prefect of the Seine was present; and, in the midst of absolute silence, he opened his mind to the members. "You wish, gentleman," he began, "to know what is my opinion of the Treaty your Sub-Committee have elaborated in conjunction with the representatives of the promoters of the American scheme. I will tell you at once. It is distinctly and categorically unfavourable to it." M. de Selves then proceeded to give his reasons for holding this adverse opinion. He pointed out, in the first place, that it was a very serious thing to connect the finances of the City with any trading society whatsoever. Before doing anything of the kind, some assurance should be had that the parties concerned would keep to their engagements. He then went on to say that, after a thorough investigation, he had come to the conclusion that the clauses of the proposed Treaty could not possibly be complied with by the other contracting parties. The Municipal Engineers would demonstrate to the Committee that gas could not be produced at the price mentioned by the Americans; and, furthermore, he did not consider that the security they offered was adequate. In these circumstances, determined as he was to safeguard the finances of the City before everything else, he must tell the Committee plainly that the Prefectorial Administration was opposed to the scheme of MM. Devaluez and Duchanoy.

The effect of these very plain and straightforward statements by the Prefect may be more easily imagined than described. The deliberation with which they were uttered carried conviction to the minds of most of his hearers that they were not the expression of a hastily-formed opinion. At the same time, the supporters of the American scheme could not reconcile themselves to throwing up the game; and accordingly someone ventured to suggest that the Committee might vote for the scheme in spite of the Prefect. What would happen then? "I think, gentlemen," coolly replied M. de Selves, "you would be simply wasting your time. You may rely upon it that the Council of State would never sanction a transaction which would be opposed to the interests of Paris." Thereupon ensued a rather lively discussion, in the course of which M. Sauton—who has identified himself with the gas question for something like twenty years—characterized the proposed scheme as "immoral." The scene lasted about an hour. At length a member of the Committee brought something like order into the proceedings by putting a "straight" question to the Prefect. It was all very well for the Administration to stigmatize the American scheme as bad, and make up their minds to oppose it. But had they another to substitute for it? Had any propositions been made to them which would be equally advantageous for the City generally and at the same time furnish greater security? "Yes, they have," replied M. de Selves; and he immediately proceeded to substantiate this declaration. He reminded the Committee that in his first report on the subject he did not conceal from them the opinion he held that the offers made by the existing Company were worthy of consideration. Since then, however, the Directors had submitted fresh terms, to the following effect: (1) The exclusive right to supply gas for a period of twenty years, and the City to be entitled to the profits up to 17 million francs; (2) the price of gas to be 20 c. per cubic metre from 1906 to 1912, 18 c. up till 1919, and 16 c. for the remainder of the term. Moreover, the Company were willing to accept certain amendments made in the conditions under which the concession would be granted, especially those relating to the necessary expenses and the position of the staff. The Prefect acknowledged that this willingness on the part of the Company to meet the authorities had led him to decide in their favour; and he thought the Municipal Council would do well to consider the matter seriously, and examine attentively the documents he should lay before them. He felt convinced that, if they did so, they would hesitate no longer in declaring on which side was to be found the real advantage for the City. When the Prefect had finished, there was a general conversation, in the course of which some of the members supported the Company, others suggested direct control, while a third group favoured interested control. At length, the American scheme received its *quietus;* and as no other could be immediately submitted in its place, the Committee adjourned in a somewhat disorganized condition.

Though the Municipal Council were not sitting—in fact, many of the members had gone to St. Petersburg—some 15 of the Gas Committee, out of a total of 44, met at the Hotel de Ville on Monday last week, and soon passed all the clauses of the Provisional Treaty. An

important amendment was, however, made. The caution-money of 30 million francs is to be handed over in specie, and not to be guaranteed by any banking establishment. On Wednesday, about a dozen members had a meeting, and in less than an hour passed all the clauses in the conditions attached to the Treaty. These, as already mentioned, set out the various details connected with the working of the undertaking. As there are several points—such as the charge for meters and fittings let on hire—on which certain of the members of the Municipal Council have rather strong opinions, some lively debates may be expected when the whole matter comes before them during their next session, which will open on the 8th inst. The Gas Committee, however, will have a meeting a few days in advance, by which time they will doubtless be in possession of the record which M. Chautard, their reporter, will present of their proceedings in the important matter referred to them. Till then, nothing more can be written on the subject of the future control of the gas supply in Paris.

REORGANIZING THE WELSBACH CAPITAL.

The adjourned class meetings and extraordinary general meeting of the proprietors and shareholders of the Welsbach Company, for considering resolutions approving of provisional agreements that had been entered into to carry through the great scheme of capital reorganization propounded by the new Board and the Advisory Committee were duly held last Wednesday—the interval between the abortive assemblies of the week before having produced for this occasion the necessary representation either in person or by proxy. Four meetings were held—first of the preference stockholders, second of the ordinary stockholders, third of the deferred shareholders, and lastly of the general body of proprietors and shareholders. At all, Mr. Edgar Williamson presided.

In the opening sentences of the Chairman's address to the preference stockholders, it transpired that the proxies lodged with the Company represented a total of £1,251,404 preference stock. Of this there was in favour of the Board and the Advisory Committee, £1,037,806. This statement was much applauded. On the other hand, in favour of the United States Debenture Corporation, there was £204,648; and in favour of sundry stockholders, £8950. Mr. Williamson gave an analysis of these figures, and in doing so answered certain questions of which notice had been given by Mr. T. W. Blunt and Messrs. de Faria and Co. Mr. Blunt asked for the number and value of the proxies given to the Board by holders of preference stock who held no other stock or shares in the Company. Messrs. Faria sought similar information; concluding their letter with the remark: "It is obviously opposed to the most elementary justice that anyone who is an ordinary or deferred shareholder, and only a preference shareholder in a lesser degree, should be able by his vote or proxy to take away either money or their preferential rights from the preference shareholders pure and simple with one hand, and put it in his own pocket as an ordinary shareholder with the other." The answer given by the Chairman was: The total number of proxies lodged with the Company numbered 2187, and represented £1,251,404 of preference stock. In favour of the Board and Advisory Committee, there were 1868 proxies, representing £1,037,806; in favour of the United States Debenture Corporation, there were 316 proxies, representing £204,648 of stock; and in favour of other stockholders, three proxies, representing £8950. Of the 1868 proxies in favour of the Board 715—representing £459,539—were from holders of preference stock only—almost one-third of the whole of the preference stock. From persons holding two or more classes of stock, but whose preference stock exceeded in amount that of either of the junior securities, the Board had received 331 proxies, representing £378,241. Putting the two latter sums together, the Directors had support equal to a total of £837,780 from holders of either preference stock only or preference stock of greater amount than their holdings of any other class of stock. In other words, they had four-fifths of the whole of the proxies in the preference class in favour of the scheme. Then the information was given that the number of proxies in favour of the United States Debenture Corporation was 316; and of these 64 were from members holding ordinary stock in addition. The Chairman carried the analysis still farther by showing the numbers of stock and shareholders holding more than one class who had sent in proxies in favour of the Board and the United States Debenture Corporation, but not for their entire holdings; his comment on the figures being that one could only come to the conclusion that the voting was extremely even. Since the issue of the circular containing the recommendations of the Board and Advisory Committee, nothing, the Chairman stated, had transpired to alter the opinion of his colleagues and himself as to the necessities of the case, and the desirability of proceeding with the reorganization of the capital. As he truly said, it was not to be expected that the scheme submitted, or for the matter of that any scheme, would meet with the universal approval of the proprietors or shareholders; but he repeated what the Board had said before, that the scheme as presented was a fair and equitable solution of a very difficult problem. Of course, the scheme had led to a certain amount of opposition; but the Chairman was glad to say that, as time passed on, the opposition had died away, until now there was very little left. Attention was next turned by the Chairman to a letter that Colonel Bethell had addressed to "The Times," in which he propounded an alternative scheme; but by figures (which the gallant Colonel will have some difficulty in refuting) Mr. Williamson proved the superiority for the preference holders of the Board's scheme. Following this, the opposition of the United States Debenture Corporation, who recommended the proprietors to launch out again on legal enterprise and to promenade once more through the Law Courts, was criticized in a manner which greatly pleased the assembled proprietors. Capital, it was shown, had been irretrievably lost, and what was fatal to action in the manner suggested by the representatives of the Corporation was that so-called dividends had been, in the past, to some extent paid out of capital—in other words, the amount distributed had exceeded the earnings. Criticism of the opposition ended with an appeal to Mr. Lock not to carry the matter further, after this meeting, to the prejudice of the interests of his co-stockholders. This, it was pointed out, would only keep the Board and the staff occupied on unprofitable matters instead of giving them the opportunity of devoting their energies to developing the business and completing the huge task the proprietors had set them. The resolution moved by the Chairman ratified and approved a provisional agreement entered into between the Company and Mr. T. J. Brinsmead on behalf of the holders of preference stock, and provided for the modification of the rights and privileges attaching to the preference stock.

The resolution having been seconded by Mr. W. W. Mattinson, K.C., Mr. Blunt accepted the position which the figures cited by the Chairman disclosed, and stated his intention of not voting one way or the other. He did think, however, that where a prospectus had been issued, and the preference stock was made virtually a bond, it was not right, in any reconstruction scheme, to lose sight of that, and to put the preference stockholders, or any part of their holdings, in the position of ordinary stockholders. Mr. Lock pointed out that he had received additional support representing £11,225, which made his total £215,000. An eloquent speech was made by Mr. George Touch (a member of the Advisory Committee). He was agreeably astonished to find such a large body of shareholders had united so well over this very disagreeable proposal. As a compromise scheme, it was about as good a good a one as could possibly be propounded. He strongly appealed to Mr. Lock to recognize what was obviously the overwhelming wish of the great body of proprietors, and to reconsider the question, and not pursue the matter in the Law Courts. The preference shareholders, he reminded those present, were getting nearly three-quarters of the whole capital. Support to the resolution was also accorded by Mr. F. Walker.

The vote was carried by a large majority; but, in view of the fact that the Chairman had been entrusted with a large number of proxies by absent members who desired to have their views recorded, he demanded a poll. Just before the extraordinary general meeting in the afternoon, the Scrutineers reported that the number of votes recorded for the resolution was 207,517, and against 40,947.

Succeeding the meeting of the preference holders came the meeting of the ordinary stockholders. In order to be duly constituted, it was necessary to have represented, either in person or by proxy, £900,000; and, amid applause, the Chairman announced that the Board had received proxies to the extent of £1,069,634, all of which were in favour of the scheme. To the proposal there was no organized opposition; and the necessary resolution was passed without discussion.

The contrary happened at the meeting of the deferred shareholders, whose position was described by the Chairman as "a very bad one." He explained that, so far as capital was concerned, there was nothing to represent the £639,000 of deferred shares. As far as earnings were concerned, there was no reasonable probability, under existing circumstances, of the deferred shareholders getting anything. There was an accumulation of arrears—a perfect millstone of arrears - which must be swept away before there was any possibility of the deferred holders receiving any return. To put the Chairman's further explanation shortly, the deferred holders were, by the scheme, exchanging an impossible position for one in which they would be at once in receipt of a dividend. A similar resolution was moved, and Mr. Mattinson seconded it.

Mr. Walker, Mr. J. Wyatt (of Newmarket), and Mr. W. Blaker made certain criticisms, the purport of which will be gathered from the epitome of the Chairman's reply; while Mr. Ewing and Mr. Aronson took an enlightened view of the position, and were rather grateful to the Board for what they had done for them. Replying upon the discussion, the Chairman announced that the number of proxies received from deferred holders was 2032, representing between £415,000 and £420,000. As to the holders of this class of shares having been misled by the prospectus, he reminded those present that these were all vendor shares. It had been stated in the discussion that the way in which the Directors put the position before the deferred shareholders was tantamount to coercion. The Chairman explained that it had been necessary for the Board to use almost superhuman endeavours to get together a quorum of deferred holders; and unless they had come themselves and passed effective resolutions, there was no alternative for them - the deferred holders would have been wiped out entirely. There would, he added, have been no difficulty in showing the Court that their position was a perfectly hopeless one. The Board had had the greatest difficulty in preserving any rights for the deferred holders; and all they had done in the effort to preserve the situation, was to show as clearly as possible the danger of the position. The resolution was unanimously carried.

Extraordinary General Meeting.

The resolutions having been passed by the requisite majorities at the class meetings, an extraordinary general meeting was held later in the day, at which a number of resolutions were proposed (some amending and extending the Articles of Association), in order to give effect to the scheme. Among the resolutions were these—

That the £1,500,000 preference stock of the Company be, and the same is hereby reconverted and divided into 1,500,000 preference shares of £1 each, and that the 1,350,000 ordinary stock of the Company be and the same is hereby reconverted and divided into 1,350,000 ordinary shares of £1 each.

That the capital of the Company be reduced to £1,345,000, divided into 1,500,000 preference shares of 13s. each, and 1,350,000 ordinary shares of 5s. each, and 650,000 deferred shares of 1s. each.

Then followed some lengthy special provisions for empowering the conversion of the above-mentioned shares into preference stock and ordinary stock, and subsequently to reconvert these into £1 preference and ordinary shares, to the intent that the capital may consist in part of 600,000 6 per cent. cumulative preference shares of £1 each, and in part of ordinary shares of £1 each.

The resolutions were put *en bloc*, and were carried with only two dissentients. A handsome acknowledgment of the gratitude of the proprietors to the Board and Advisory Committee having been made, the proceedings terminated.

OPENING OF NEW GAS-WORKS AT NEWPORT (FIFE.).

On Wednesday last, handsome new gas-works, which have been erected for the Corporation of Newport (Fife.), were inaugurated by Provost Roger, of that burgh. The old works were situated at the foot of a cliff, and so near the waters of the Firth of Tay that there was no room for a roadway between the works and the sea, while on either side were buildings which prevented lateral extension. In such a situation, it was impossible to extend the works in any direction; and not only was much outlay entailed in keeping up the gas supply, but there were also repeated expressions of dissatisfaction with the results, which is not surprising. Some years ago, the Newport Gas Company resolved to translate their works to a fresh site; and on looking around, they fixed upon a place at Northfield, to the east of the town, as the most suitable for their purposes. It lies on a slope overlooking the Firth, which is about 100 feet below. There is just comfortable room for the works between the Tayport Road and the North British Railway. Having come to terms with the ground landlord, the Company three years ago erected in a corner of the site a single-lift gasholder of 60,000 cubic feet capacity. Then followed the transfer to the Corporation, which was carried through amicably and economically in the summer of 1901, upon the advice, for the Corporation, of Mr. James M'Gilchrist, of Dumbarton. The transfer accomplished, Mr. M'Gilchrist, upon the instructions of the Corporation, prepared plans for the new works. These were adopted; and Mr. M'Gilchrist having been continued as Engineer, the work was given out to various contractors. Operations were begun last July, under the superintendence of Mr. John M'Gilchrist, a son of the Engineer, who was appointed Resident Engineer. So expeditiously has everything been placed in position, that on Monday night the work of making gas was quietly discontinued in the old works, and was at once begun in the new ones, which had, of course, been under heat some time previously.

The works are of a capacity of 30 million cubic feet a year, which will, in ordinary circumstances, be sufficient for the supply of the district for a good few years. But in every department room has been left for doubling the plant. The retort-bench and chimney were erected by Mr. C. M. Hamilton, for Messrs. R. and G. Hislop, the Contractors, upon whose regenerative system the retort-bench is constructed. Messrs. Henry Balfour and Co. erected most of the remaining plant, including a set of four annular condensers; a set (three in number) of Creeke's annular scrubber-washers; the purifiers, consisting of three boxes, 12 feet square, fitted with a travelling bucket, designed by Mr. James M'Gilchrist, by means of which the work of filling the purifiers is greatly facilitated; an elevated tar-tank; the telescoping of the gasholder, making it of 120,000 cubic feet capacity; the necessary connections; and the galvanized iron roof for the retort-house and coal-store. The exhauster, supplied by Messrs. R. & J. Dempster, is of a capacity of 15,000 cubic feet per hour. In the same house—a beautifully fitted-up apartment—is the station meter, of 8000 cubic feet per hour capacity, furnished by Messrs. James Milne and Son. The governor-house, erected beside the gasholder, contains a Peebles patent governor; and in a specially constructed apartment is a bar photometer supplied by Messrs. David Grant and Co. Steam for driving the scrubber-washer and the tar and water pumps is provided by a Cornish boiler by Mr. Penman, placed at the end of the retort-bench; and it is a feature of the design that all the working machinery is situated within a restricted area, by which arrangement there is a minimum loss of heat. Alongside the retort-house, and under another span of the roof, is a coal-store, 83 ft. by 108 ft., capable of holding 800 tons of coal. In the retort-bench, there are 22 retorts, in three ovens—two of eights and one of six. The purifier-house is in line with the coal-store, against the back wall of the works, outside of which, at a higher level than the floor of the works, a railway siding has been laid down, in which fifteen waggons can be accommodated. Coal and lime are thus brought into the works expeditiously and cheaply, and tar and liquor can be run from the elevated tank into waggons. On one of the annular condensers, there is a plate displaying an inscription which gives the date of the opening of the works and the names of the Provost, the Convener, and the Engineer.

The opening ceremony took place in presence of a company of about eighty persons. Provost Roger presided, and called upon the Convener of the Gas Committee (Mr. J. P. Robertson) to charge one of the retorts. This having been done, Provost Roger declared the works open; remarking that this was the first great municipal enterprise in Newport. The company were then conducted through the works, which were explained to them by Mr. M'Gilchrist. Subsequently they assembled around tables which had been set out in the coal-store, and were entertained to cake and wine. The toast of "The Gas Committee" was proposed by Provost Stewart, of Monefieth; and Mr. Robertson, in acknowledgment, stated that since the Town Council acquired the gas supply they had reduced the price of gas from 5s. 5d. to 4s. 10d. per 1000 cubic feet. The Town Council paid £10,500 for the undertaking; and they had expended about an equal sum in the erection of the new works and the extension of the gas-mains to Wormit. They had that day appointed Mr. John F. Black, who had been for some years assistant to Mr. John Black, his father, Manager of the works; and in the name of the Council, he had much pleasure in presenting Mr. Black, junior, with a purse containing £25, as a mark of the Council's appreciation of the energy and enterprise he had always shown in the discharge of his duties. Mr. Black having suitably acknowledged the gift and the kind remarks which had been made regarding him, Mr. R. T. Leitch, of Newport, proposed the toast of "The Engineer." Mr. M'Gilchrist, in reply, said that not only were they now able to supply Newport with gas, but also Wormit, which was perhaps the largest populous district in Scotland without a gas supply. The electric light was furnished in Wormit; but since the introduction of gas, there had been so many applications for it that electricity had been killed. The new works were also sufficient for the supply of Tayport, at the other end of the district; and if this should come to pass, they would then, from the Newport works, supply an area six miles in length. The elder Mr. Black came to Newport 42 years ago, when the annual make of gas was 400,000 cubic feet; but there had been a great change since then. Mr. M'Gilchrist then presented Mr. Robertson with a statuette in bronze, in the form of a lady holding erect a large crystal shell with an incandescent gaslight inside, standing on a pedestal, bearing an inscription stating that it was presented by the Engineer and Contractors on the occasion of the opening of the new gas-works. Mr. Robertson having thanked the donors, Bailie Thom, of Newport, proposed the toast of "The Contractors," in reply to which Mr. R. Creeke, of Messrs. Henry Balfour and Co., returned thanks. Afterwards Mr. M'Gilchrist proposed the health of Mr. Black, senior, who, in acknowledgment, expressed his pleasure at knowing that the many troubles which had had to be met, and which it had been beyond his power to overcome, were at an end.

ALDERSHOT GAS AND WATER COMPANY.

The New Offices.

The staff of the Aldershot Gas and Water Company have lately been transferred to new and more commodious offices in Victoria Road; and those of our readers who visit the Royal Academy Exhibition, and seek the rest which is invariably to be obtained in the room devoted to architecture, will find therein a drawing by Mr. T. Davison, the architect, which will give them a good idea of the building he has put up. The outside presents a very attractive appearance; the red bricks of which it is composed being liberally treated with stonework. Over the entrance there is a carving of Father Neptune, and over the centre window on the Victoria Road side representations of the God of Fire and Light and the God of Water. This window is one of the best features of the outside of the building; and when all the inside fixtures have been completed, it will be filled with a collection of the best designs of cooking and heating stoves and other gas appliances. On passing the entrance, the visitor finds himself in commodious premises. The office has been constructed to accommodate fifteen clerks and twelve collectors. The mahogany desks are fitted with artistic gas-standards; and there are several large pendants, with inverted incandescent gas-burners, hanging from the ceiling. A handsome oak staircase leads to the floor above, where the Directors' room (36 ft. by 21 ft.) and the Secretary's office are found. At the rear of the main building there is a large covered yard, beyond which are the gasfitters' and plumbers' workshops, and the foreman's, timekeeper's, and storekeeper's offices. A building has also been constructed to contain the photometer and other gas-testing apparatus. Above these buildings are the stores. The most noticeable feature of the new offices is the lighting. The windows have Keith high-pressure lamps of 1000-candle power; the general offices, counters, Board-room, and Secretary's office are fitted with inverted incandescent burners; and the desks have ordinary "C" burners. Nearly all the standards and pendants were specially made for the Company from their own designs; and they were all fitted by their workmen. The new building is generally regarded as an adornment of the town; and it will certainly be the means of demonstrating to the inhabitants the capabilities of gas as an illuminating and heating agent.

DEVONPORT GAS AND ELECTRICITY SUPPLY.

A Meeting of the Devonport Town Council was held last Tuesday—the Mayor (Mr. J. C. Tozer) presiding—to consider the rates for the ensuing year. Mr. W. Hornbrook, the Chairman of the Gas Committee, referring to the financial result of the past year's working, said it was satisfactory alike to the Committee, the Council, and the town. It must be remembered, however, that they had to look forward to an expenditure of £10,000 per annum on interest and sinking fund, and that this had to be earned before they could come to the Council and say they had a balance. He hoped, therefore, the Council would not be insistent in their demands for a reduction in the price of gas. In the meantime, he objected to the £827 profit made by the Committee last year being used for the reduction of the rates. They would have need of an extra £2000 next year for interest and sinking fund; and it would be wise to carry forward the present balance. Alderman Goodman, the Chairman of the Finance Committee, thought that any surplus money should be devoted to the general funds. It was, however, agreed, on the motion of Mr. Hornbrook, to put the £827 into a reserve fund.

The Electric Power Committee reported a loss of £2473, and recommended that it should be placed to a suspense account. Mr. G. H. Smith, jun., the Chairman of the Committee, contended that the position of the electricity undertaking was really more satisfactory than the accounts indicated. They had not yet had a full year's lighting; and experience showed that undertakings of this kind were never remunerative at the outset. They were supplying a very large amount of current for tramway traction; and though the price they charged was low, it was the figure fixed by arbitration, and was not unremunerative. With regard to public lighting, he did not think they had been treated fairly. When the scheme was first brought up, a large amount was set aside to be expended in cables for public lighting. These had been laid, but were scarcely used. It was said that the price was too high; but he did not think it was so in comparison with other towns. What could they expect when they cut the Committee down to 16 public lamps? They could supply a larger number at a less average rate; but while the number of lamps was so small, they could not possibly reduce the price. Private lighting was increasing, and in a short time the deficit would be wiped out. A discussion took place as to the legality of carrying the adverse balance to a suspense account; and, on a division, it was decided, by 15 votes to 7, to take this course, though the Town Clerk opposed it.

MONTE VIDEO GAS COMPANY, LIMITED.

The Thirty-first Ordinary General Meeting of this Company was held last Thursday, at Winchester House, Old Broad Street, E.C.—Mr. T. C. TATHAM in the chair.

The SECRETARY (Mr. H. Kearns) having read the notice convening the meeting, the report and accounts were taken as read.

The CHAIRMAN, in moving their adoption, went through the items in the accounts that appeared to him to be most interesting. In regard to the capital account, he said it would be seen that it was slightly different from last year, as they brought into account for the first time the new 5 per cent. debenture stock. The Directors issued £29,740 of that stock in July, 1902, and of the old debentures, which amounted to £58,080, they had now paid off in cash £34,960, and had exchanged £7840 for the new 5 per cent. debenture stock; so that of the old debenture debt there only now remained £15,280. It would take about three years to pay off the remainder; but, of course, this could be done at once if all the debenture holders exchanged for the new 5 per cent. debenture stock. The reserve account now stood at £39,040, which was £3560 less than this time last year, because this sum was applied to extinguish a similar amount of the 5 per cent. debentures. The insurance fund remained at £12,500. The Directors had also taken from this year's profit, as a special reserve, £1000. They thought this was a prudent thing to do, as they had to complete certain works extensions. The contingency account was about £475 more; and this was accounted for by the increased value of some of the investments. The interest accrued on debenture stock was, of course, a new item; but the interest on debentures was about £300 less. Sundry creditors in Monte Video and London amounted to £5346, which was about £1900 more than in the preceding year. There was an item in the previous year's accounts, which, he was glad to say, had vanished entirely, and that was £11,500 which the Company owed their bankers. Turning to the credit side of the account, the total capital expenditure was £601,581; and this was after deducting the amount written off for depreciation, and adding £1841 which had been spent on improvements and extensions of new mains, and services. The total on balance was increased by £490. The stocks, which was the next important item, stood, on the whole, at a reasonable figure. They were on balance £580 more than in the previous year. Coal, for instance, was about £500 more; the Directors, of course, having a desire to keep a good stock at the works. Gas-fittings stood at, comparatively, a very moderate figure—viz., £7832; the Directors having been able to steadily reduce the amount from, he believed, about £12,000. The item of materials for use—such as mains, pipes, tubes, fire-clay goods, and, indeed, all the numerous stores which were required for the carrying on of a gas company—was another example. It had decreased by £835; but still they had plenty. Stores for sale were about £570 more. Sundry debtors—£16,201—were £660 less. This item consisted of all money owing to the Company on Dec. 31 for gas bills not paid, and all goods supplied; but he was glad to be able to say that, with the exception of a very small amount, it had all since been paid. Of course, this was satisfactory. He now came to the most important item in the accounts—viz., the Government debt, which had so often been talked about at the meetings. It represented gas and gas-fittings supplied to the Government offices from April, 1889, to June, 1890. The Government had never denied the debt—indeed, the Company held a certificate that it was correct. They had always believed it would be paid; and therefore had always kept it among the assets. But, fortunately, they had never credited themselves with interest on the debt. The debt had now been settled—if that was the correct term to use—by ignoring all claim for interest, by deducting 9 per cent. for charitable purposes, and by giving bonds of a new amortizable debt (second series) for the residue. This new debt did not bear any interest. It was redeemable by a 4 per cent. sinking fund to be applied in the purchase of the bonds by tender. The market value of the bonds in December was about 30; and the Directors had therefore taken this as their value, and had written off the difference between that and the face value of the debt. The alternative, if they did not take the new bonds, was to go without, and wait until the 4 per cent. sinking fund had redeemed the debt of those who had accepted it. As a great majority, so far as the Directors could find out—in fact, nearly everybody in the same position as the Company—accepted the terms, the Directors had accepted them likewise. He did not know that anything he could say would be stronger than the mere statement of the facts; and therefore he was not going to discuss them any further. The investments amounted to £32,596. They were about £1150 less than in the previous year; but this was owing to the Board having sold some of the securities. Having referred to other items which reflected the improved financial position of the Company, the Chairman turned to the revenue account, which, on the whole, he ventured to say was satisfactory, bearing in mind the very strong competition they had with the electric light undertaking, which was a Government enterprise. It showed on the credit side an increase of about £1130 on the previous year. The expenses at Monte Video were rather higher, as one would naturally expect from the increased receipts from the dock and dock workshops; but there was an increased balance of revenue of £635. As to the profit and loss account, they brought forward £6996; and the balance on revenue account for the year was £27,330. Interest, profit on exchange, and Directors' fees waived (under circumstances which the shareholders would remember) made a total of £35,374. The whole of the expenses on this side of the issue of the debenture stock had been charged against the income of this year; but there was a sum in the shape of a small tax to be paid on the other side, of which the Directors had not had particulars. Then they wrote off for bad and doubtful debts over £700, and £1200 off capital account. They had also retained £1000 for a special reserve, and took out of the year's profits the whole of the loss they were obliged to face on the decrease in the value of the Government debt. This left a balance of £26,136, out of which, in addition to the dividend already paid, the Board proposed to pay a further dividend at the rate of 4 per cent., and to carry forward to next year a balance of £7168. He had been careful to go through these figures at some pains, in order that the shareholders might see that the Directors were endeavouring to carry the business on in the most careful and economical way. Their policy was that of gradually strengthening their position as a Gas Company supplying the private consumer. He said this because, as the shareholders knew, they had had to face the entire loss of what was originally the backbone of the business—viz., the supply of the public lights. This used to be as high as between £22,000 and £23,000; last year it amounted £265. This was a thing the Directors could not help; and the only thing was to do the best they could under the circumstances.

Mr. M. T. HOOD seconded the motion.

Mr. HERTZHEIM inquired if the Directors had made any effort to get coal (say) from Sydney, where, he believed, it was much cheaper than in England.

Mr. ASHLEY STABLES asked if information could be given as to what the investments—£24,347—consisted of.

Mr. EDWARDS and Mr. BARBER also made certain inquiries; the latter asking whether, in the opinion of the Chairman, there was any probability of the consumption of gas increasing. He noticed that the number of consumers had advanced; but there was a small decrease in the actual consumption.

The CHAIRMAN, in reply to the above and other questions, said the reduction of the income-tax had been discussed; but they were told that, inasmuch as this was a declaration of a dividend which was earned previous to Dec. 31, they had to deduct up to the 1s. 3d. He could not say that he himself was convinced that this was the case. The explanation of the fact that, though the number of consumers had increased, the consumption had decreased, was that it was owing to the development of the incandescent light. For his own part, he was always glad to see anything that cheapened the commodity he had to sell. He did not think it desirable to publish the details of the investments; but shareholders could obtain the information privately. The Directors had looked most carefully into the question of buying coal from other countries than England. They had had tenders from the United States and, he believed, from New South Wales; but they had always found in comparison their own coal account was a most favourable one. There were many things to bear in mind besides buying the coal. There was, for instance, the question of freights. They were fortunate lately with freights—getting done now for 8s. 6d. what cost them 20s. last year. They commanded the position very much better by shipping their own coal than would be the case in shipping from other countries, besides which they could buy coal here better than it could be bought from other centres.

The motion was unanimously carried.

On the proposition of the CHAIRMAN, seconded by Mr. SIMPSON ROSTRON, a dividend at the rate of 8s. per share (less income-tax), making 3½ per cent. for the year, was declared.

Moved by the CHAIRMAN, and seconded by Mr. ROBERT MORTON, the retiring Directors (Messrs. Rostron and Hood) were re-elected.

The Auditors having been re-appointed, the usual complimentary votes terminated the proceedings.

CAPE TOWN AND DISTRICT GAS COMPANY.

The Ordinary General Meeting of this Company was held last Thursday, at the London Offices, New Broad Street House, E.C.—Mr. JOHN BOUSTEAD, J.P., in the chair.

The SECRETARY (Mr. H. Yuill) read the notice convening the meeting; and the report and accounts were taken as read. It was shown that the result of the year's working was a profit of £29,958, to which had to be added £951 brought forward. Deducting debenture interest and the dividend on the preference shares, and £2469 for the expenses connected with the issue of debenture stock during the year, there remained £19,059. A dividend at the rate of 10 per cent. per annum was declared for the June half year, and a final dividend at the same rate was now recommended.

The CHAIRMAN, in moving the adoption of the report and accounts and the declaration of the dividend, said this was more or less a record year; and it was the third in which they had paid so high a dividend as 10 per cent. for the year. In view of this, he thought he could congratulate the shareholders generally upon the success of the Company; and, in doing this, it might perhaps be of interest to have a little review of what had been accomplished during the time the present Board had administered the affairs of the concern. At the start, the great object was to improve the distribution system. This was done by the replacement of all the old mains, which, through time and perhaps not very correct laying, had entailed a large amount of leakage. This they succeeded in reducing, and so had improved the revenue. The next question was that of extensions. The area of supply had been very considerably increased; and there was a certainty that there would be still further extensions from time to time. The development naturally implied a great increase of capital; and it was satisfactory to know they had so far obtained the confidence of the most important money market of the world, that they were able to meet these developments without a great increase of capital. Under these circumstances, if they, with the stress and strain of the last two years in consequence of the war, had been able to have an uninterrupted progress, he thought they would not be too sanguine in believing that, with the re-establishment of peace and commercial relations with the Colony, they might look for still further progress—to the benefit not only of the Company, but in favour of the reduction of prices to the consumers. He was satisfied the future of the Company must be one of great increase.

Mr. HERTZHEIM inquired if any effort had been made to procure coal locally; and he regarded the item of "discounts, allowances, and bad debts, £3951" as very great.

Mr. HARRIS said that three years ago there was a weak point in the Company which he considered should be strengthened. They then had no reserve fund; but the Directors in one year put £7500 to reserve. This was an excellent beginning; but he would urge them

not to pay more than 10 per cent. dividend until they had greatly augmented the fund. They had a heavy capital account; but he had so much confidence in the future prosperity of the Company that this did not alarm him in the least.

Mr. J. E. LILLEY, in seconding the motion, replied to the points raised. With regard to the procuring of coal locally, the Board had been giving attention to this for some years. There was plenty of coal to be had in Cape Colony; but the shareholders would be surprised to learn that some of the coal from the Colony itself had cost the Company more than they could ship coal for from home. Perhaps at that time circumstances were unfavourable as to cost and carriage; but, even if it were not so, they found the coal they had been able to get from the places where the price and carriage would allow them to do so at anything like a reasonable figure, was of such a quality that it was quite unfit for gas making. Up to the present, in fact, they had been unable to get any coal that would compete at all with English coal—that could approach the usefulness of English coal, at the price at which it could be delivered. They had tried some local coal that produced hardly any gas; and they had tried other coal which produced a fair amount of gas, but which did not leave behind that important residual—coke—which had so much to do with the success of a gas company. They were sorry, because English coal cost them a lot of money; and now they had to pay 1s. a ton duty, which they had not to pay before. Notwithstanding, the Company were able to make good profits. As to the increase in the item of allowances, discounts, and bad debts, the Directors had considered it to be in the interests of the Company to reduce the price of gas by allowing increased discounts. It had always been their practice to allow extra discounts to large consumers; and they had adopted this course in order to induce people to use gas for gas-engines. It had helped them very much indeed in increasing the consumption. They had also decided, instead of reducing the price of gas, to make a reducti n to those people who paid their accounts promptly, in addition to the ordinary discounts. This would probably cost them £7500 a year; but the Directors were not at all afraid of making this reduction. Their desire was to give satisfaction in Cape Town and to the neighbouring Municipalities, their relations with whom were of the best. As to the bad debts, they had written off a large amount; but this would not prevent them recovering the money. But there were some which it would be difficult to collect, owing to the fact that during the war there were a large number of people living in Cape Town and the suburbs who, after the war, went up to Johannesburg, Pretoria, and other places. Of these the Directors had made a clean sweep. Respecting Mr. Harris's remarks, it was the desire of the Board to strengthen the reserve fund; and this would be seen by the fact that they were proposing to add £7000 to it from the present accounts—making the total £16,000. As to the large expenditure of capital, this would be a saving to the Company. During the past year, they had finished the erection of one new holder, and nearly completed the erection of another, which would accommodate more gas than all the other holders put together; and when he mentioned that they had laid 24 miles of new mains—some of them of large size—and greatly increased the number of the consumers, which had entailed the provision of new meters, the shareholders would see the money had been well spent. During the past year the increase in the number of consumers was 556.

The motion was unanimously carried.

Proposed by Mr. J. A. KELMAN, and seconded by the CHAIRMAN, Mr. H. R. Savory was re-elected a Director of the Company.

The Auditors having been re-appointed, a resolution was passed increasing the remuneration of the Directors by £300.

The customary votes of thanks concluded the proceedings.

HUDDERSFIELD CORPORATION GAS SUPPLY.

A Comparison of Two Years' Working.—The Charge for Gas.

At the last Monthly Meeting of the Huddersfield County Borough Council, the minutes of the Gas Committee contained a comparative statement by the Borough Treasurer (Mr. S. C. Potts) of the coal and oil carbonized and gas consumed, by way of supplement to his financial statement submitted at the previous meeting.

	Year ended March 31, 1902. Tons. Cwt. Qrs.		Year ended March 31, 1903. Tons. Cwt. Qrs.
Coal carbonized	60,598 8 2	..	62,140 14 1
Oil used	147 19 0	..	256 0 0
Cubic feet of gas sold—			
Lighting, at 2s. 9d.	286,971,200	..	266,277,400
Stoves and power, at 2s. 3d.	143,984,900	..	147,663,500
Pre. meters at 2s. 9½d.	79,314,600	..	90,986,600
Public and private lamps	56,628,100	..	55,666,158
Contracts and market hall	638,200	..	640,800
Special supply, at 3s.	80,000	..	1,200,000
Totals	567,617,000	..	562,434,458

The Committee had passed the following resolution: "That, having considered the financial statement for the past year, the Committee are of opinion it is inopportune at the present time to entertain any proposal for the reduction of the charges for the supply of gas, and that the consideration of the subject be deferred." Alderman Jessop having moved the adoption of the minutes, Mr. W. J. Barras asked that the one on the carbonization of coal should be referred back for further discussion. Alderman Jessop said he had no objection to the matter being discussed. He pointed out, however, that the statement had been sent by the Borough Treasurer, and had nothing whatever to do with the Committee's work. Mr. Barras proceeded to compare the figures for the two years, and suggested that, as there appeared to be a serious leakage somewhere, the Committee ought to give the statement further consideration. The Mayor (Alderman Calvert) said the matter rested entirely with the Chairman of the Gas Committee. If he were magnanimous enough to allow it to be discussed in committee, it could be; but if not, he would have to put the resolution to the meeting. Alderman Jessop, for the third or fourth time, agreed to the matter being discussed in committee, but added that the statement would remain on the minutes. The amendment was therefore withdrawn. Mr. Woolven, referring to the resolution on the minutes declining to make any reduction in the price of gas at present, remarked that the Corporation charged more for gas for cooking and heating purposes than any other in the North of England. It seemed to him that there was something radically wrong with the Gas Department. The profits they were making were simply ridiculous, especially when the Council considered that they had a monopoly in regard to the supply. The extra 3d. per 1000 cubic feet was put on because coal had risen in price; but when it had come down to its normal figure they were not making so much as they did formerly, the amount falling to about £4000 from £6000 to £7000. He thought the matter required some explanation. Alderman Jessop denied that the Corporation charged more for gas for cooking and heating than was done in any town in the North of England, for, as a matter of fact, the Huddersfield price was less when the discount was reckoned off—being 2s. 1½d. per 1000 cubic feet. He quoted a number of towns, and in most cases the charges were considerably more. Huddersfield thus occupied a very favourable position when compared with other towns. The demand for gas at the cheaper rate was growing, and that for illuminating gas had been gradually decreasing; and the income had been falling off. The Council were aware that the alteration in the price of the gas for cooking and heating purposes was made because of the rise in the price of coal, and this had not gone back to its normal position, if it had one. Last year coal cost £32,000, against £24,000 the previous year, which was a very serious matter; and other items had gone up pretty much in the same way. The rates on the Gas Department amounted to £4518 and the income-tax charges had increased. He could assure Mr. Woolven that the Gas Committee were as anxious as any member of the Council could be to reduce the price charged for gas; but it cost them 2s. 5d. per 1000 cubic feet to make, and they were clever enough to sell some gas at 2s. 1½d., and gas for illumination purposes at 2s. 9d., and he was not in favour of lowering the charge at present. If the Council desired to come to the same conclusion as Mr. Woolven, well and good; but the difference would have to be partially paid by those who did not consume gas, and it would be unfair to them. Mr. Woolven said he was not anxious for a reduction in the price of the gas; he wanted to see a profit in the Gas Department. The resolution was carried.

WEST BROMWICH CORPORATION GAS SUPPLY.

A Successful Year.

The annual statement of accounts in connection with the Gas Department of the West Bromwich Corporation has just been issued by the Secretary (Mr. T. Hudson). No additions were made to the capital account during the year; and by reason of the increased sales of gas, the average expenditure on this account stands at 12s. 1d. per 1000 cubic feet of gas sold—the lowest point yet reached. The sales of gas show an increase over the previous year of about 1 per cent.; but a comparison of the figures relating to the different classes of consumers reveals considerable variation. For instance, the sales to ordinary consumers (the largest class) decreased more than 3¼ per cent.; while those to prepayment meter consumers increased 6¾ per cent., and for motive power and other manufacturing purposes by 21 per cent. The income from gas sold, notwithstanding these increases, is £645 below that of the previous year, caused by the reduction in the price charged for public lighting, amounting to £1000. The income from prepayment meter consumers was £9029. The number of houses in the borough is 13,863; and of this number 4748 are supplied with gas through ordinary meters, and 5448 by means of prepayment meters—a total of 10,196. The number of consumers of all kinds at the close of the past financial year was 10,503, an increase of 193. The total consumption of gas was 321,141,665 cubic feet, or nearly 1 per cent. more than in the year 1901-2. The quantity of gas sold during the year was more than 95 per cent. of the make—a result never before achieved in the borough. The aggregate income from residual products was £414 below that of the previous year. The returns for coke were £957 less; but those for tar and ammoniacal liquor were more by £455. The total income from all sources was £57,021, compared with £58,112 in 1901-2—a reduction of £1091. The total expenditure on the trading account was £43,997, against £48,997; being a reduction of £5000. The total manufacturing charges amounted to £31,730—a reduction of £5112. The quantity of coal carbonized was 27,731 tons, yielding 306,750,000 cubic feet of gas, or an average of 11,062 cubic feet per ton; being an increase of 346 cubic feet. The quantity of coke used in the manufacture of water gas was 517 tons; the yield of gas being 30,641,000 cubic feet, or 59,267 cubic feet per ton. The total quantity of gas made was 337,391,000 cubic feet, or 1,776,000 cubic feet less than in the previous year. The quantity sold was 304,575,700 cubic feet, against 301,778,000 cubic feet—an increase of 2,797,600 cubic feet. The loss by leakage and condensation was 11,601,835 cubic feet; representing 3·44 per cent. of the make—the lowest in the history of the undertaking. The general effect of the decreased percentage of loss was that, though the sales of gas were 2,797,600 cubic feet in excess of the previous year, the quantity made was 1,776,000 cubic feet less. The gross profit on the trading account amounted to £13,023, against £9114 before; being an increase of £3909, or 7·21 per cent. on the capital debt. The balance standing to the credit of the profit and loss account at the commencement of the year was £11,129; while at the close it stood at £15,186. The surplus remaining after providing for all charges and liabilities was £4057.

BOLTON CORPORATION GAS SUPPLY.

The Gas and Lighting Committee of the Bolton Corporation have recently presented to the Town Council their abstract of the accounts of the Gas Department for the year ending March 31. It shows that the revenue from the sale of gas to private consumers and for public lighting (less discounts) was £127,030, against £125,374 in the preceding twelve months; while residuals fetched £37,166, compared with £36,991; the sale of meters, &c. (less cost of wages and materials) produced £1165, against £770; and the total revenue was £166,433, against £163,932. The manufacture of gas cost £85,549, compared with £94,393 (coal costing £58,040, against £67,346); distribution, £8505, against £8546; and management, £2376, against £2087—the total expenditure being £104,662, compared with £112,849. The balance carried to the profit and loss account is £61,771, whereas this time last year it was £51,083. The balance to the credit of this account at the close of the year was £62,291; and after meeting interest and the payment into the sinking fund (£3697) and the district fund (£16,350), a sum of £18,542 was transferred to the reserve fund account, the total of which is £30,871. Payments to the amount of £19,763 were made out of this fund during the year; £10,000 was carried to the capital account for the extinction of liabilities (in addition to sinking fund provisions); and a balance of £1107 is carried forward. The following are the statistics of manufacture for the past two years:—

	1902.	1903.
Coal and cannel carbonized in tons . .	100,400 ..	99,606
Average cost per ton delivered	13s. 5d. ..	11s. 7¾d.
Percentage of cannel used	3·23 ..	2·05
Gas made in cubic feet	1,029,155,000 ..	1,019,993,000
" " " " per ton	10,250 ..	10,240
Gas accounted for per ton	9,779 ..	9,741
Gas unaccounted for per cent.	4·59 ..	4·87
Maximum quantity in cubic feet supplied in 24 hours	5,947,000 ..	5,829,000
Minimum quantity supplied in ditto . .	870,000 ..	868,000

With regard to the works and plant, which are under the supervision of Mr. A. E. Saville, a second two-lift gasholder was reconstructed at the Spa Fields station, and converted into a three-lift, during the year. The usual careful attention was paid to the improved street lighting of the borough, and additional lamps fixed where necessary. There were 118 added, bringing up the total to 5059 in the borough. The number in the Turton and Horwich districts being 735, the number throughout the area of supply on the 31st of March last was 5794, compared with 5659 at the corresponding date in 1902.

SALES OF STOCKS AND SHARES.

At the Mart, Tokenhouse Yard, E.C., last Tuesday, Mr. Alfred Richards sold, under instructions received from the Directors of the Lowestoft Water and Gas Company, 400 additional ordinary £10 shares and £1000 of 4 per cent. perpetual debenture stock of the Company. The shares rank for a maximum dividend of 7 per cent.; but the last paid on similar shares was at the rate of 5¼ per cent. per annum. They were placed at prices ranging from £11 5s. to £11 10s each; and the stock was sold at £104 and £106 per £100. On the same occasion he sold, also by order of the Directors, £5460 of 4 per cent. perpetual debenture stock of the Southend Gas Company, at 100 and 100¼. He was also entrusted with the disposal of a new issue of £3000 of consolidated ordinary stock of the Chigwell, Loughton, and Woodford Gas Company, ranking for a standard dividend of 5 per cent. per annum, subject to the sliding-scale; an equivalent dividend having been paid to the 31st of December last on the Company's existing capital. The greater part of the stock was sold at par; but three £100 lots fetched £101 and two lots £102 each. At the Greyhound Hotel, Croydon, a few days ago, Messrs. Fuller, Moon, and Fuller sold by auction a parcel of "A" stock in the Croydon Gas Company, at the rate of £312 per £100 of stock; also a parcel of "B" stock in the same Company at the rate of £252 per £100 of stock. The Ashbourne Gas Company, having found it necessary to considerably enlarge their premises, decided to issue some new ordinary £10 shares. These were recently offered to the public by auction at the Hall Hotel; and they fetched £23 17s. 6d. and £23 15s. per share. Recent dividends paid by the Company have been at the rate of 12 per cent.

ELECTRIC LIGHTING NOTES.

A Final Effort at Ladywell Workhouse.

At the last meeting of the St. Olave's (Bermondsey) Guardians it was reported that the electrical installation at Ladywell Workhouse having proved most unsatisfactory, an expert had been called in. He found that the wiring had been wrong at the start, and that the engineer had been working in ignorance throughout. It would cost £1500 to put the installation in proper order. Several members objected to any further expense being gone to; but finally it was decided to lay out the £1500. It was understood, however, that this will be the final effort; and if satisfactory results are not obtained, electric lighting will be abandoned.

Southwark's Electric Light.

The report of the Special Committee appointed by Southwark Borough Council to inquire into the administration of the electric light undertaking, to which reference was made in the "JOURNAL" for the 19th ult. (p. 467), was again considered on Wednesday evening. It was stated that 33 per cent. of the plant was idle; that the loss on the undertaking was upwards of £1000 a year; and that the side streets were disgracefully lit. The "muddle" was generally condemned. After a discussion lasting more than three hours, the recommendations of the Committee (one of which was that there should be a canvass for customers) were put *seriatim*; and all were negatived by large majorities.

Fusions of Wires and Resulting Fires.

In the early hours of the morning, last Sunday week, a Police Constable noticed a strong smell arising from the cellar of Messrs. Shann's premises in Manchester; and an investigation revealed the fact that there had been a fusing of the electric wire. Information was sent to the generating station; but before a proper inspection could be made there was a loud explosion, which caused considerable damage to the basement. Timber and heavy stones were thrown about; and almost immediately afterwards smoke was seen to be issuing from the adjoining cellar. After an hour's hard work, however, the fire was extinguished; and some 20 yards of fused cable was discovered. The cause of the explosion and fire is unexplained. Shortly before eleven o'clock the following morning, the London firemen turned out with steamers and long ladders in answer to three "calls" which they received in rapid succession from the police. They found that two underground fires in connection with the electric light mains were in progress—one at the Milk Street end of Cheapside, and the other 150 yards away in Watling Street. Some men were at work in Cheapside upon the cables of the City of London Electric Light Company, when the cables suddenly fused. The immediate result was a burst of flames. Simultaneously the lid of the distributing box in Watling Street was blown off, and fire poured out. The traffic was completely stopped. Extinction was effected by means of sand.

A Successful Year at Bolton.

There are several interesting items in the abstract of the accounts of the Electricity Department of the Bolton Corporation for the year ended the 31st of March. The total expenditure is £12,884, against £12,480 for 1901-2; but, on the other hand, the balance carried to the profit and loss account has gone up to £20,807 from £17,319—an increased expenditure of £400 thus accounting for £3500 additional profit. The total profit is disposed of as follows: Interest on mortgage debt, £5686; depreciation, £9222; reserve fund, £976; in aid of rates, £4500; carried forward, £1324. The income is £33,691, made up of £15,670 for private lighting, £144 for public lighting, £1961 for power, £14,281 for tramway traction, £597 for meter-rents, £235 for motor-rents, and £803 profits on the fitting trade. The amount spent on capital during the year was £27,224—all on new works. The expenditure up to March 31 was £207,482, on which £30,430 had been written off for depreciation; the debt paid off being actually £25,120. In the matter of generating electricity, Bolton, for the year ending March, 1902, had the record for the lowest cost in the United Kingdom, with the figure 0·959d. In the past year it was still lower—0·813d. The cost, inclusive of all capital charges, works out at 1·754d., and the average selling price is 2·092d. In 1896, the capital expenditure per 1000 Board of Trade units sold stood at £367. Every year has seen a reduction, and now it stands at £54 11s. 3d.; and next year a still further drop may be anticipated. The sum of £9222 allowed for depreciation is at the rate of 6 per cent. on the machinery, mains, and transformers, and 10 per cent. on accumulators, meters, motors, and instruments.

PUBLIC LIGHTING OF NEWPORT (MON.).

Gas v. Electricity.

The "South Wales Daily News" for the 26th ult. contained the following copy of a letter which, at the request of his Board, was sent by the Secretary of the Newport (Mon.) Gas Company (Mr. T. H. Hazell) to the Town Clerk, with regard to the proposal of the Corporation to erect more electric arc lamps in some of the thoroughfares.

My Directors have had their attention called to the fact that the Corporation of Newport propose to erect 68 electric lamps in Corporation Road, Caerleon Road, Church Road, Shaftesbury Street, Chepstow Road, Stow Hill, Charles Street, and Bridge Street, displacing the 93 gas-lamps at present lighting these streets. The total number of electric arc lamps in the town would then be 144. My Directors request me to make you the offer of erecting 144 lamps with triple Welsbach self-intensifying burners, the cluster in each lamp giving 1050 candles illuminating power at, and for, the capital cost of £17 per lamp, or a total of £2448 for the 144 lamps.

This price includes service, lanterns, burners, taps, and columns all complete and fixed. It will be seen that this capital expenditure is less by £4252 than the capital sum for electric lighting. With respect to the lighting, maintenance, repairs, and upkeep of these lamps, this Company is prepared to supply gas and carry out the work of lighting, extinguishing, painting, and repairing the lamps, including renewal of mantles, at, and for, the sum of £12 per lamp per annum; being £1728 per annum for the total number—viz., 144 lamps. As regards the hours of lighting, they are to remain the same as those now scheduled, and each cluster of burners to remain full on until midnight; but after midnight two burners to be turned off in each cluster, leaving a light of 350-candle power in each lamp. This arrangement would give, in the opinion of my Directors, a better distribution of light than turning out one-half of the lamps; but my Directors would be prepared to carry out this proposal if insisted upon.

My Directors desire also to call attention to the great economy that would be realized by using gas instead of electricity. The interest and sinking fund on £6700, the proposed capital for electricity, is £402; and the cost of electricity is £2304 per annum—making a total of £2706.

The interest and sinking fund on £2448 capital for the gas system is £147 per annum, and the cost £1728 per annum—making a total of £1875, and showing a saving as follows:—

Cost of lighting by electricity (144,000-candle power) .	£2706
Cost of lighting by gas (151,200-candle power) . . .	1875
Difference in favour of gas (per annum). . . .	£831

or a saving of £5 15s. 5d. per lamp per annum.

I trust that your Lighting Committee will give this offer their favourable consideration, and would point out that, after wide experiments, incandescent gas has been reinstated as a means of public lighting by the authorities in London (including the principal Metropolitan boroughs) and Liverpool; and it is either wholly or for the greater part similarly established in, among others, the following progressive cities and boroughs: Birmingham, Bolton, Bradford, Brentford, Cambridge, Coventry, Eastbourne, Folkestone, Halifax, Huddersfield, the whole Crystal Palace District (London), Portsmouth, Ramsgate, Southport, and a large part of Sheffield.

METROPOLITAN WATER BOARD.

A Meeting of the Board was held last Friday, at the Offices of the Metropolitan Asylums Board—Mr. R. M. BEACHCROFT in the chair.

The Finance Committee reported that they had received the following copy of a letter, dated the 20th ult., and signed by Mr. J. Lithiby, one of the Assistant-Secretaries, which the Local Government Board had addressed to Sir Edward Fry with reference to the remuneration assigned to the Arbitrators under the Metropolis Water Act, 1902:—

Sir,—I am directed by the Local Government Board to advert to your letter of the 4th inst., and to state that, in pursuance of the provisions of section 23 (4) of the Metropolis Water Act, 1902, they have decided that the remuneration to be assigned to each of the Commissioners who form the Court of Arbitration under the Act shall be as follows: At the rate of £500 a year from the date of the Commissioners' first private meeting, held on Jan. 21 last, to the date on which the Court hold their first sitting or the actual hearing of a claim under the Act, and at the rate of £5000 a year for a period of twelve months from the last-mentioned date. The Board accordingly hereby assign to each of the Commissioners remuneration at the foregoing rates. I am to add that, if the work of the Court be not concluded at the end of the above-mentioned period, the question of the remuneration of the Commissioners during any subsequent period will be further considered by the Board.

It was arranged that the Finance Committee should report in due course as to the provision to be made to meet this liability.

The Law and Parliamentary Committee reported that they had arranged with Messrs. Linklater to undertake the business connected with the pending arbitrations, and had also concluded an arrangement with Mr. H. L. Cripps on the terms indicated in a former report. The statements of claim of the Companies and of the Urban District Councils of Enfield and Tottenham had been deposited; and the time had therefore arrived for deciding in what way the Board could most effectually exercise control over and direct the business before the Court of Arbitration. The Board, on the 23rd of April, when appointing the Law and Parliamentary Committee as a standing committee, entrusted to them (*inter alia*) the preparation and conduct of the cases for arbitration, on the assumption that this part of their duty would be delegated to a small Sub-Committee; and the recommendations the Committee now made were as follows: (*a*) That a Special Committee be constituted for the purpose of directing and controlling the arbitration proceedings; (*b*) that for this purpose the resolution of the Board of April 23, so far as it charged the Law and Parliamentary Committee with that duty, be rescinded; (*c*) that the Committee be empowered to employ such Counsel, Engineers, Accountants, Agents, and witnesses as may be found necessary in connection with the arbitration proceedings, and to incur such expenditure as may be necessary, notwithstanding any conditions contained in the Standing Orders relating to expenditure; (*d*) that the Committee do consist of the following members of the Law and Parliamentary Committee: Messrs. Barnard, Bradford, C. Burt, Dickinson, Glass, Pickersgill, Radford, Thornley, and M'Kinnon Wood, together with the Chairman of the Board and the Chairman of the Law and Parliamentary Committee.

Mr. H. P. HARRIS moved the adoption of the report.

Mr. LIDIARD moved, as an amendment—"That the Committee be selected by the Board, and not by the Law and Parliamentary Committee, and that the members of the Board be invited at this meeting to hand in to the Clerk the names of the nine or any smaller number of members whom they would select to serve on such Committee; that the nine members receiving the greatest number of votes be elected; and that they, with the Chairman of the Board and the Chairman of the Law and Parliamentary Committee, be constituted the Special Committee."

The amendment was lost; but it was decided to add the Chairmen of the Finance Committee and the General Purposes Committee to the Special Committee.

The CHAIRMAN informed the Board that at the sitting of the Court of Arbitration that morning the various Water Companies were ordered to amend their statements of claim, and that the 26th of October was appointed for hearing the first case—that of the East London Water Company.

Mr. H. CLARKE, the Chairman of the General Purposes Committee, brought up an urgency report, stating that Mr. William Terrey, who was appointed Clerk to the Board at the last meeting, had withdrawn from the appointment, on the ground that no provision was made for a superannuation allowance.

It was decided to refer the matter to the General Purposes Committee to bring up the names of three candidates at the next meeting.

The CHAIRMAN stated the regulations had just been received from the Local Government Board relating to the issue of Water Board stock, and, as the matter was urgent, they should be considered at once.

The Finance Committee were instructed to consider and report on the regulations forthwith.

The Board then adjourned for a fortnight.

The Past Year's Working at Cockermouth.—At a recent meeting of the Cockermouth Gas Committee, the Gas Manager (Mr. A. F. Young) submitted his report and statement of accounts for the year ending March 31. The balance-sheet showed that the gross profit on the year's working was £1025. After deducting from this £519 paid for interest on loans, and £412, the amount of principal repaid, the net balance available was £93. This sum increased the working balance from £1425 to £1518. In moving the adoption of the minutes, Mr. Stephenson said that while the available balance was small, he could say it had been honestly earned. They had not starved the plant and works in order to show a good balance. They had had rather a hard task, because the works were in a bad condition when taken over; and the Committee had an Old Man of the Sea on their backs in the shape of a heavy capital account. They had, however, had a fairly satisfactory year.

METROPOLITAN WATER ARBITRATION.

Guildhall, Westminster—Friday, May 29.

(*Before Sir* EDWARD FRY, *Chairman, Sir* HUGH OWEN, K.C.B., *and Sir* JOHN WOLFE-BARRY, K.C.B.)

The Court of Arbitration, constituted as above, appointed under the Metropolis Water Act, 1902, to determine the price to be paid by the Water Board, formed in accordance with the provisions of the Act, for the undertakings of the London Water Companies, held their first meeting to-day. The Companies had forwarded to the Court their statements of claim in the following order: New River, East London, Grand Junction, West Middlesex, Lambeth, Southwark and Vauxhall, and Kent; and the Tottenham and Enfield Urban District Councils had also sent in claims.

There was a large array of Counsel present. For the Water Board, Mr. FLETCHER MOULTON, K.C., Mr. FREEMAN, K.C., the Hon. J. D. FITZGERALD, K.C., and Mr. SHAW appeared. The Counsel retained for the Water Companies were Mr. BALFOUR BROWNE, K.C., Mr. C. A. CRIPPS, K.C., M.P., Mr. C. BAGGALLAY, K.C., Sir E. CLARKE, K.C., Mr. E. BOYLE, K.C., Mr. HALDANE, K.C., Mr. F. W. PEMBER, Mr. D. C. BARTLEY, Mr. T. N. SNAGGE, Mr. W. C. RYDE, Mr. J. KEMP, Mr. W. M. LOEHNIS, Mr. A. G. DU CANE, Mr. B. HOUGHTON, Mr. T. MATHEW, Mr. C. J. TALBOT, Mr. F. H. MAUGHAN, Mr. A. J. RAM, K.C., and Mr. KEEN.

The CLERK (Mr. Arthur Paget) having called upon certain Urban Councils in Kent to show cause why they should be heard,

Mr. RAM said he appeared on behalf of the Beckenham, Bexley, Bromley, Dartford, Erith, and Foot's Cray Urban District Councils, praying to be heard in the arbitration between the Water Board and the Kent Water Company. These Councils would be very largely interested in the amount that would be paid by the Board to the Company, because for a long time they had been trying to get themselves made into a Joint Board, together with certain Rural Councils in their immediate neighbourhood, for the administration of the water undertaking in their own district. These Councils stood in a different position from other districts in the neighbourhood of London. So far as the Kent Company provided them with water, the supply was derived from chalk wells in this area, and they had no supplies from any river or any other external source in the area.

The CHAIRMAN: If I understand rightly, you are a body of people who hope to acquire the undertaking of the Kent Water Company. You have no claim, but you are hopeful purchasers.

Mr. RAM said that was so; and they had had three or four Bills in Parliament for the purpose. But the promoters had never been heard. The Bills were introduced for the most part when the London County Council were also seeking to take over the works of the Kent and other Water Companies; and when the application of the Council was unsuccessful, the Bills promoted by the Kent Authorities also came to an end. But not only had they never been rejected, but on certain occasions the suggestion had been made that the promoters ought to come in the future. After the arbitrations had taken place, they might have an opportunity of acquiring the undertaking of the Kent Company. They only wished to be heard as to the price; and the basis of his application was this: In the event of the Kent Company being purchased, the price given would, no doubt, have an effect upon the question of a transfer to a Joint Board. The Local Authorities he represented therefore asked to have an opportunity of discussing the price to be paid, and of cross-examining on the matter.

Mr. BALFOUR BROWNE: I do not know that it is necessary to reply; but I object on the part of the Kent Water Company.

The CHAIRMAN: We refuse the motion, with costs.

The CLERK next called upon the New River Company.

Mr. MOULTON said his application on behalf of the Water Board related to the statement of claim delivered by the Company. By clause 3 it was provided that each of the Metropolitan Water Companies who had not previously agreed with the Water Board as to the amount of compensation to be paid to them should deposit a statement of claim, together with a short statement of the ground of the claim. The New River Company had deposited a claim which did not comply with the order. The directions given were of great importance. The intention of the tribunal was that a *bonâ fide* statement of claim should be submitted, with adequate materials; and the Water Board were, on the 17th of August next, to deliver an answer setting forth the amount of compensation they were willing to pay, together with a concise statement of any relevant facts. The Court of Arbitration therefore expected the Board to take into consideration the claim of the Company, and to make an offer of such sum as was thought fair by way of compensation. He did not think he was going too far in saying the claim should furnish an adequate statement of facts, the nature of the claim, and the way in which it was supported, to enable the Water Board to verify the facts in order to make an offer for the purchase without further litigious proceedings. The New River Company wholly failed to satisfy the demand. He submitted that there was absolutely nothing which could even assist the Water Board in deciding what was a proper sum to offer for the purchase of the undertaking. The statement of claim set forth the history of the Company, which had not very directly a bearing on the problem before the Board. Section 9 said that the Company were not subject to any limitation of the amount of dividend which they might distribute among their shareholders; and next that they had for many years past charged in respect of a great number of valuable premises in the City much less than the rate they were entitled to charge, and that they were thus in a position to raise their charges. They could also increase the charge for their water for domestic purposes. This was all stated very generally, without any figures whatever. Then they said that they had been put to considerable expense in past years in connection with opposition to Bills in Parliament; and they claimed such sum in water stock as would produce, by the interest thereon, the annual sum of £350,000.

There was no single fact given to explain this figure, or how it was arrived at.

The CHAIRMAN: The possible increases are stated.

Mr. MOULTON: But it gives little detail that is not of much assistance. Then they went on to speak of the recoupment by the payment in cash of the amount expended under the Staines Reservoirs Acts, and as to allowances for expenses in connection with the passing of the Act.

The CHAIRMAN: We are not discussing the merits of the case.

Mr. MOULTON: No; but the figure should certainly be given. The direction in the order is that a figure—it may be an estimated figure—should be put in to enable this figure to be met by an offer; but without it, this would be impossible. With regard to the recoupment of the cash paid in respect to the Staines reservoirs, the figures were in their possession, and certainly ought to be given; and with regard to the amount to be expended, there ought to be an estimate given. There was a vast difference between the facts obtained by the examination of the Company's books on the part of the Board and admission by the Company. The facts given in the statement of claim were in the nature of admissions, and, of course, binding on the Company; the others were only matters capable of proof, and subject to all the difficulties and uncertainties of proof. He submitted that there should be adequate admission as to those circumstances to enable the Board to act upon it.

The CHAIRMAN (addressing Mr. Balfour Browne): The Court do not wish to anticipate your argument; but would there be any objection on your part to this information: First, the present net divisible income of your Company (which represents, I suppose, a large part o the £350,000 which you claim) and the part of that £350,000 which you attribute to the possible interest on income. If you gave us the one, the other would follow. Secondly, to tell us by amendment how much is the amount of money you have already expended on the Staines reservoirs, and how much you take as likely to be useful expenditure in the future.

Mr. BALFOUR BROWNE: I think we can answer those questions without any difficulty. With regard to the first matter, as te our present divisible income, as your Lordship knows, under section 42 of the Act they are to have the fullest access to our books.

The CHAIRMAN: It is the basis of their claim.

Mr. BALFOUR BROWNE: Yes, the basis; but there are adjustments after divisible income. I can give them at once; and they will find the information in the ordinary half-yearly accounts of the Company. Beyond that, they have no right to go. You can amend that.

The CHAIRMAN: The order is to be amended to-morrow, showing the net divisible annual income and the portion of the £350,000 which you claim for possible increase.

Mr. BALFOUR BROWNE: That will be a difficulty.

The CHAIRMAN: It will follow, supposing your net income comes to £350,000.

Mr. BALFOUR BROWNE: It is only in the increases year by year discounted by present value. They could easily do it.

The CHAIRMAN: And the £350,000 would be possible increase. The next point is that you are to state in figures the amount already expended by you under the Staines Reservoirs Act, and the amount which is likely to be expended.

Mr. BALFOUR BROWNE: It shall be done.

Mr. MOULTON: I do not understand your decision with regard to the increase. Are the figures with regard to increase of the income to be given?

The CHAIRMAN: In this sense, that they are to give how much of the £350,000 of income they attribute in the first place to the existing divisible income, and, secondly, to the probable future interest.

Mr. MOULTON: The definition clause defines undertaking to include "all rights of taking, distributing, and supplying water, and all other their rights, powers, authorities, and privileges, and all such property, real and personal, including cash balances, reserve funds, investments, and all other interests and right in, to, and out of, the property real and personal, and obligations, and things in action, as may be in the possession of the Company, or belonging to them, immediately before the appointed day, and all books, accounts, and documents relating thereto, but subject to all debts, liabilities, and obligations of the Company by this Act transferred to the Water Board." Of course, the whole of that which defined the undertaking to be valued was in the possession of the Company; and they asked that the Company should be required to give particulars. It was perfectly true that they had a right; but while inspection is extremely valuable for the purpose of checking their claim, it would give the Board an enormous amount of trouble to ascertain what the undertaking was.

The CHAIRMAN: Is not that to some extent shown by the way they put in their claim? They put the annual income. This shows that they are treating it as what it produces—the entire concern. Is it necessary to have every right-of-way and every easement.

Mr. MOULTON: Yes. They may frame their claim as they like. What you have to value is the undertaking—what has been taken over. The particulars of what the property is must be before the tribunal.

The CHAIRMAN: No; if you buy a going concern like a fruit shop, you buy by the annual profit. It is not necessary to have a catalogue of all the articles of the shop, or the various things which make up the undertaking.

Mr. MOULTON: Certainly. Is it to be suggested that, supposing the whole of their rights are perpetual, the same price would be paid as if the rights only lasted for ten years? The value of the undertaking depends upon what it is. If, for instance, all their premises were leased, the value is far less than if they were freehold.

The CHAIRMAN: Do you want an abstract of title?

Mr. MOULTON: No; a statement of what their rights are. Supposing their rights with regard to their water are quite insufficient for future years, then it follows that its present income is a bad security. But if, on the other hand, they are such that, no matter what the claims and obligations are, they would be satisfied, then it is a well secured income. That which the tribunal has to value is the undertaking;

GAS AND WATER COMPANIES' STOCK AND SHARE LIST.

Referred to on p. 574.

Issue.	Share.	When ex-Dividend.	Dividend or Dividend & Bonus.	NAME.	Closing Prices.	Rise or Fall in Wk.	Yield upon Investment.
£			p.c.	GAS COMPANIES.			£ s. d.
590,000	10	April 17	10½	Alliance & Dublin 10 p.c.	19—20	..	5 5 0
100,000	10	,,	7½	Do. 7 p.c.	13—14	..	5 7 2
200,000	5	May 14	6½	Bombay, Ltd.	5½—6*	..	5 8 4
140,000	5	,,	6½	Do. New, £4 paid	4—4½	..	5 15 7
380,000	Stk.	Feb. 26	12	Brentford Consolidated	240—245	..	4 18 0
286,700	,,	,,	9	Do. New	178—183	..	4 18 4
50,000	,,	,,	5	Do. 5 p.c. Pref.	131—136	..	3 13 6
206,250	,,	Dec. 11	4	Do. 4 p.c. Deb.	110—113	..	3 10 10
220,000	Stk.	Mar. 12	10½	Brighton & Hove Orig.	212—217	..	4 19 1
246,320	,,	,,	7½	Do. A. Ord. Stk.	151—156	..	4 19 4
460,000	20	Mar. 31	10	British.	39—40	..	5 0 0
100,000	Stk.	Mar. 12	6	Bromley, 5 p.c. "A"	118—123	..	4 17 7
165,700	,,	,,	4½	Do. 3½ p.c. "B"	90—95	..	4 14 9
500,000	10	May 14	7	Buenos Ayres (New) Ltd.	11¼—11¾*	..	5 19 2
250,000	Stk.	Dec. 30	4	Do. 4 p.c. Deb.	94—96	..	4 3 4
150,000	20	Mar. 12	8½	Cagliari, Ltd.	23—25	..	6 12 0
100,000	10	Sept. 26	10	Cape Town & Dis., Ltd.	15—16	..	6 5 0
50,000	50	May 2	6	Do. 6 p.c. 1st Mort.	52—54	..	5 11 1
1,375,000	Stk.	Feb. 26	5	Commercial 4 p.c. Stk.	103—106	..	4 14 4
503,750	,,	,,	4⅝	Do. 3½ p.c. ,,	99—102	..	4 13 2
407,812	,,	—	3	Do. 3 p.c. Deb.,,	89—92	..	3 5 3
800,000	Stk.	Dec. 11	8	Continental Union, Ltd.	127—132	+½	6 1 2
200,000	,,	,,	7	Do. 7 p.c. Pref.	140—145	..	4 16 7
575,000	Stk.	Feb. 26	5½	Crystal Palace Ord. 5 p.c.	113—118	..	4 10 2
60,000	,,	,,	5	Do. 5 p.c. Pref.	120—125	..	4 0 0
106,158	,,	Jan. 15	5	Do. 5 p.c. Deb. Stk.	137—140	..	3 11 5
486,090	10	Jan. 29	10½	European, Ltd.	18—19	..	5 10 6
354,060	10	,,	10½	Do. £7 10s. paid	13—14	..	5 12 6
15,243,200	Stk.	Feb. 12	4 1/10	Gas-light and Coke: 4 p.c. Ord.	85—87	−1	5 1 2
2,600,000	,,	,,	3½	Gas-light and Coke: 3½ p.c. max.	85—87	..	4 0 6
3,799,735	,,	,,	4	Gas-light and Coke: 4 p.c. Con. Pref.	108—110	..	3 12 9
4,193,975	,,	Dec. 11	3	Gas-light and Coke: 3 p.c. Con. Deb.	88—90	.	3 6 8
252,500	Stk.	Mar. 12	5	Hastings & St. L. 3½ p.c.	90—95	..	5 5 3
70,000	10	Oct. 30	8	Hongkong & China, Ltd.	15—16	..	5 0 0
3,800,000	Stk.	May 14	10	Imperial Continental	203—208*	+1½	4 16 1
473,600	Stk.	Feb. 12	3½	Do. 3½ p.c. Deb. Red.	100—103	..	3 8 0
165,242	Stk.	Mar. 12	6	Lea Bridge Ord. 5 p.c.	115—120	..	5 0 0
561,000	Stk.	Feb. 26	10	Liverpool United A	218—220	..	4 10 11
718,100	,,	,,	7	Do. do. B	166—168	..	4 3 4
306,083	,,	Dec. 31	4	Do. do. Deb. Stk.	112—114	..	3 10 2
75,000	5	Dec. 11	5	Malta & Medn., Ltd.	4½—5	..	5 0 0
560,000	100	April 1	5	Met. of 5 p.c. Deb.	103—107	..	4 13 6
250,000	100	,,	4½	Melbourne 4½ p.c. Deb.	101—103	..	4 7 5
541,920	20	Nov. 13	3½	Monte Video, Ltd.	10—11	..	6 7 4
1,515,892	Stk.	Feb. 20	4½	Newc'tle & G'tesh d Con.	104—105	..	4 5 9
376,855	Stk.	Jan. 2	3½	Do. 3½ p.c. Deb.	96½—97½	..	3 11 10
300,000	Stk.	May 14	8	Oriental, Ltd.	140—145*	..	5 10 4
600,000	5	Mar. 31	7	Ottoman, Ltd.	6—7	..	5 0 0
					* Ex. div.		

Issue.	Share.	When ex-Dividend.	Dividend or Dividend & Bonus.	NAME.	Closing Prices.	Rise or Fall in Wk.	Yield upon Investment.
£			p.c.	GAS COMPANIES.			£ s. d.
105,005	Stk.	Jan. 15	6⅛	Ply'mth & St'house 5 p.c	127—132	..	4 12 9
851,070	10	April 30	7	River Plate Ord.	11¼—11⅝	..	5 19 2
300,000	Stk.	Dec. 30	4	Do. 4 p.c. Deb.	95—97	..	4 2 6
250,000	10	April 17	8	San Paulo, Ltd.	12—13	..	6 3 1
135,000	Stk.	Mar. 12	10	Sheffield A	239—241	..	4 3 0
209,984	,,	,,	10	Do. B	237—240	..	4 3 4
523,498	,,	,,	10	Do. C	237—239	..	4 3 8
103,235	Stk.	Mar. 31	5	Shrewsbury Ord. 5 p.c.	111—114	..	4 7 9
6,000,000	Stk.	Feb. 12	5½	South Met., 4 p.c. Ord.	119—122	+1	4 7 4
1,580,000	,,	Jan. 15	3	Do. 3 p.c. Deb.	90—92	..	3 5 3
380,940	Stk.	May 14	5	Southampton Ord.	105—110*	..	4 10 11
87,950	,,	Jan. 15	4	Do. 4 p.c. Deb.	103—106	..	3 15 6
120,000	Stk.	Feb. 26	6	Tottenham and Edmonton: A. 5 p.c.	117—122	..	4 13 4
300,520	,,	,,	4½	Tottenham and Edmonton: B. 3½ p.c.	96—99	..	4 10 11
182,380	10	Dec. 30	8	Tuscan, Ltd.	8½—9½	..	8 8 6
149,900	10	Jan. 2	5	Do. 5 p.c. Deb. Red.	94—96	..	5 4 2
730,872	Stk.	Mar. 12	5	West Ham, 5 p.c. Ord.	95—100	..	5 0 0
				WATER COMPANIES.			
780,662	Stk.	Dec. 30	11½	Chelsea, Ord.	315—325	..	3 10 9
150,000	,,	,,	5	Do. 5 p.c. Pref.	145—150	..	3 6 8
160,000	,,	,,	4½	Do. 4½ p.c. Pref. '75	130—140	..	3 4 4
175,785	,,	Mar. 31	4½	Do. 4½ p.c. Deb.	137—142	..	3 3 5
1,720,560	Stk.	Mar. 31	8	East London, Ord.	240—245	..	3 5 3
654,740	,,	Dec. 11	4½	Do. 4½ p.c. Deb.	142—147	..	3 1 3
1,282,943	,,	,,	3	Do. 3 p.c. Deb.	96—98	..	3 1 3
700,000	50	Dec. 11	10†	Grand Junction: 10 p.c. max.	140—145	−1½	3 8 11
310,000	Stk.	Mar. 31	4	Grand Junction: 4 p.c. Deb.	123—128	..	3 2 6
708,000	Stk.	Feb. 26	10½	Kent	300—310	..	3 7 9
160,000	,,	,,	7	Do. New, 7 p.c. max.	200—205	..	3 8 4
1,043,800	100	Dec. 30	11	Lambeth, 10 p.c. max.	320—330	..	3 6 8
406,200	100	,,	8½	Do. 7½ p.c. max.	225—235	..	3 12 4
350,000	Stk.	Mar. 31	4	Do. 4 p.c. Deb.	122—127	..	3 3 0
500,000	100	Feb. 12	12 5/10	New River, New Shares	430—440	−5	2 18 2
1,000,000	Stk.	Jan. 29	4	Do. 4 p.c. Deb.	123—128	..	3 2 6
902,300	Stk.	Dec. 11	7	South-wark and Vauxhall: Ord. 7½ p.c. max.	275—280	−5	2 10 0
126 500	100	,,	7	South-wark and Vauxhall: 5 p.c. Pref.	215—225	..	3 2 3
489,200	Stk.	,,	5	South-wark and Vauxhall: 4 p.c. A Deb.	150—153	..	3 5 4
1,019,585	,,	Mar. 31	4	South-wark and Vauxhall: 4 p.c. A Deb.	122—127	..	3 3 0
1,155,066	Stk.	Dec. 11	10	West Middlesex.	300—310	..	3 4 6
200,000	,,	,,	4½	Do. 4½ p.c. Deb.	138—143	..	3 2 11
200,000	,,	Mar. 12	3	Do. 3 p.c. Deb.	95—97	..	3 1 10
					* Ex. div.		

† Next dividend will be at this rate.

and it is absolutely necessary, both for the Water Board who have to pay and for the tribunal who have to decide as to what is fair to pay, that they should know what it is that has been bought. I submit that by far the most convenient method is that particulars should be given by the Company of the facts which define their undertaking. Take the case of their works. They can certainly give us the particulars of them. They can give them with very much greater ease than we can get them. If there is anything in which they are inaccurate, we can then show it; and it would shorten the inquiry. I referred to the definition clause in the Act as being the authoritative definition of that which is on the one hand sold and on the other is being purchased. In the London Water Commission of 1897-99, an elaborate statement of the nature I refer to was put in by the New River Company. If the Water Company accept this statement, and supplement it by a note of any changes, it could be put before the tribunal. If they will bring it up to date, and we are to assume that it is correct, then we might cross-examine upon it. We will take the case of the whole of their mains. We do not know what date they were laid down; they may be mains which require almost immediate renewal. This condition bears upon it as an income-producing undertaking, and immensely on the value. I submit that is the most convenient way to proceed, and our request is reasonable.

The CHAIRMAN: You are willing to adopt that as being the statement of 1899?

Mr. BALFOUR BROWNE: We will not deny it. With regard to the other matter, it is one for cross-examination.

The CHAIRMAN: We make no present order; but in the event of the Water Board making out a case, we will allow them sufficient time to meet it.

The CHAIRMAN: It has been admitted by Counsel for the New River Company that the statement for 1899 was correct in 1899; and there is no further necessity to go into that.

Mr. BALFOUR BROWNE: Before the sitting of the Court to hear these cases, I suggest that the Accountants on both sides should meet and see how far they can agree on figures with regard to the past. In many cases this has been done, and an agreed statement has been put before the tribunal, and has been found very convenient; and it would eliminate a great number of questions. I suggest, as the Water Board have an Accountant, that he should meet us at once; and we are quite prepared to give him all the figures and agree his statement and table.

Mr. MOULTON: That is what I wish to do on particulars.

The CHAIRMAN: It seems a very reasonable suggestion that the Accountants should meet; and I hope it will be acted upon.

Mr. BALFOUR BROWNE: With regard to the property of the Company, we are asked as to whether we have plans showing the properties and reservoirs and so forth. We have, and they shall be submitted, because we are anxious to remove any difficulties or causes of delay.

Mr. MOULTON then took the case of the East London Company. He said the statement of claim gave statistics as to the number of houses and the number of persons and the gross revenue; but it gave no indication of the value. It gave the maximum dividend, but not the amount of the net income; and it furnished the statement with regard to the total divisions in previous years. They did not state whether they were even now paying their maximum dividend.

The CHAIRMAN: You want the present net value of the income given?

Mr. MOULTON: Yes. The tribunal will adhere to the principle of the previous decision as to what the net income is.

Mr. BALFOUR BROWNE: That can be arrived at from those figures. They can find that out.

The CHAIRMAN: You can give some figure to bring out the annual income.

Mr. BALFOUR BROWNE: We can give the constituent figure which is the basis of it.

Mr. MOULTON: Then we want a percentage given.

The CHAIRMAN: I think that would be reasonable.

Mr. BALFOUR BROWNE: That is the allowance. I cannot give that, because the allowance for recoupment of loss of interest on reinvestment depends upon the amount awarded.

Mr. MOULTON: You can state it by way of percentage.

Mr. BALFOUR BROWNE: We can turn it into a lump sum, or we will do it by way of percentage.

The CHAIRMAN: Then that is agreed. Now we come to the Grand Junction Company.

Mr. MOULTON: The Grand Junction Company is very much on the same lines as the East London.

Mr. BALFOUR BROWNE: We shall give the same particulars as I have pledged myself to with regard to the East London Company.

Mr. CRIPPS: With regard to the West Middlesex and Lambeth Companies, we give in each of these cases the difference between the present income and the prospective income. We do not give it in the form of percentage at all; but we shall give as good an estimate as we can. In the Lambeth case, we have given the net income as distinct from the prospective income; and we shall give what we can by way of allowance. As to the West Middlesex, with reference to past profits on dividend, we could not calculate that at present.

Mr. BALFOUR BROWNE: I will give the same information for the Southwark and Vauxhall Company.

Mr. BOYLE: In the Chelsea case, you have got all you want.

Mr. MOULTON: I think not. I can see no net income.

The CHAIRMAN: If they do not put their claim on the net income, if they show it in an intelligible way, that is all that is required.

Mr. BALFOUR BROWNE: With regard to the Kent Company, we have given particulars.

Mr. MOULTON said there remained the case of the Tottenham Urban District Council, which did not give anything about income.

The CHAIRMAN: They say, "We have, as a District Council, spent a certain amount of money, which has produced certain works, and they have depreciated to a certain extent; pay us what they are worth." I think that is intelligible.

Mr. TALBOT: I appear for the Urban District Council. We have no

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income in the ordinary sense. We are perfectly willing to give any information and to say how much the deduction is attributable to depreciation, and how much dead capital.

After some further discussion,

The CLERK read out a statement that orders had been made in the following cases of the Companies: New River, East London, Grand Junction, West Middlesex, Lambeth, Southwark and Vauxhall, Chelsea, and Kent. Also of the Tottenham and Enfield Urban District Councils.

The Court retired for the consideration of the date of their next sittings. On returning,

The CHAIRMAN said: We have considered the applications with regard to the time of our sitting, and our conclusion is to sit on Monday, the 26th of October, at half-past eleven o'clock; and we hope to sit during the other days of that week at eleven o'clock, adjourning about half-past four. Where we shall meet is a question that we cannot decide at the present moment.

A discussion then took place as to which case should take precedence. The New River Company were entitled to be heard first; but Mr. Moulton asked that the East London should be taken in preference. Mr. Balfour Browne objected; saying there would be questions in connection with the New River which might possibly have to be stated in the form of a special case. The New River Company's was a complicated case; and if a special case had to be stated, the decision might be helpful as a guide to other cases.

The CHAIRMAN: Would not it be helpful to give us a simple case?

Mr. BALFOUR BROWNE: There is no simple case. But I have not the least objection, if you think it more convenient, to begin with the second on the list—namely, the East London.

The CHAIRMAN: Our inclination is rather in favour of that course; and therefore we will take the East London first and the New River second. Except so far as varying the order for the East London to be taken before the New River Company, we intend to adhere to the order in which the Companies' claims were handed in.

The Court then adjourned till the date named above.

LAMBETH WATER-WORKS COMPANY.

The Half-Yearly General Meeting of the proprietors in this Company was held last Tuesday, at the Offices, Brixton Hill—the Right Hon. Viscount HAMPDEN, G.C.M.G., in the chair.

The SECRETARY (Mr. H. Wilkins) read the notice calling the meeting; and the report of the Directors for the half year ended March 31 was taken as read. It stated that during that period 1887 houses and other supplies of water, estimated to yield an annual rental of £4503, were connected with the works, against 1724 houses, &c., producing a rental of £4115, laid on in the six months ended March 31, 1902. The revenue account shows an increase of £5342 in the water-rents, and a decrease of £1021 in the expenditure, compared with the corresponding period last year. The payment to the Chamberlain of the City of London on account of the sinking fund was a little more than last year, owing to the increase of dividend. As the Company will shortly cease to exist, the necessity for maintaining this fund is at an end. The Directors, therefore, recommend that, instead of transferring only a sufficient sum to meet exceptional expenditure incurred during the past half year, the whole amount now standing to the credit of the contingency fund be transferred to dividend and interest account. The Directors do not suggest any increase in the dividend on the present occasion, as some money may be required for purposes in connection with the transfer of the undertaking to the Water Board and the subsequent dissolution of the Company, which could most conveniently be paid from the balance of undivided profits. The surplus transferred from revenue account to dividend and interest account is £85,916. There is to the credit of the latter account, after payment of interest on debenture stock, an available balance of £81,432, to which may be added the contingency fund (£45,712). The Directors recommend that dividends at the prescribed rates of 10 and 7½ per cent. per annum respectively be paid on these two stocks, together with a payment on both descriptions of 10s. per cent. (being at the rate of 1 per cent. per annum) on account of deficiencies of previous dividends. A balance of £599 will remain to be carried forward, in addition to the sum of £45,712 proposed to be transferred from the contingency fund, after making provision for the payment to the Chamberlain.

The CHAIRMAN observed that it had been said—and he thought with truth—that "in life there is nothing so uncertain as death." Speaking generally, it was very difficult to indicate exactly the time; but in the case of the London Water Companies, he thought it was safe to say that their continued existence might now be a matter only of months—perhaps, even, of weeks. This impending dissolution was a fact which detracted from the satisfaction the Directors felt in presenting a report so favourable as that which they now submitted. Since the general meeting of the Company last year, the London Water Bill had passed both Houses, and had received the Royal Assent; the Water Board had been elected and had met; and a Court of Arbitration had met and received statements of claims from the different Companies. Nevertheless, he did not suppose that any real progress would be made in the arbitration until the autumn, more especially as, it was understood, the Water Board were about to make a proposal for further time in order to consider the claims which the Companies had put in. This was really a point which he urged on the attention of Mr. Long last year. Speaking generally, the accounts were satisfactory, and certainly showed an improvement on those for the corresponding period of last year. It would be observed that they were not audited by the Government Auditor; but this was simply owing to the ill-health of Mr. Stoneham, which the proprietors would regret in common with the Directors. The new business might be considered highly satisfactory. The number of new supplies laid on was 163 more than for the winter half

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BLACKBURN	1,250,000	ST. CATHERINES (Remodelled)	250,000	ACCRINGTON	500,000
WINDSOR ST. WORKS, BIRMINGHAM	2,000,000	KINGSTON, PA.	125,000	TONBRIDGE	300,000
SALTLEY WORKS, BIRMINGHAM	2,000,000	PETERBOROUGH, ONT.	250,000	STRETFORD	500,000
COLCHESTER	300,000	WILKESBARRE, PA.	750,000	OLDBURY	300,000
BIRKENHEAD	2,250,000	ST. CATHERINES (Second Contract)	250,000	TODMORDEN	500,000
SWINDON (New Swindon Gas Co.)	120,000	BUFFALO, N.Y.	2,000,000	SALTLEY, BIRMINGHAM (Third Contract)	2,000,000
SALTLEY, BIRMINGHAM (Second Contract)	2,000,000	WINNIPEG, MAN.	500,000	YORK (Second Contract)	750,000
WINDSOR ST., BIRMINGHAM (Second Contract)	2,000,000	COLCHESTER (Second Contract)	300,000	ROCHESTER (Second Contract)	500,000
HALIFAX	1,000,000	YORK	750,000	NEWPORT (MON.)	250,000
TORONTO	250,000	ROCHESTER	500,000	TOKIO, JAPAN	1,000,000
OTTAWA	250,000	KINGSTON, ONT.	300,000	PERNAMBUCO (Brazil)	125,000
LINDSAY (Remodelled	25,000	CRYSTAL PALACE DISTRICT	2,000,000	MALTON	150,000
MONTREAL	500,000	DULUTH, MINN.	300,000	DULUTH, MINN. (Second Contract)	300,000
TORONTO (Second Contract Remodelled)	2,000,000	CATERHAM	150,000	BROCKVILLE (ONT.)	250,000
BELLEVILLE	250,000	LEICESTER	2,000,000	SMETHWICK	500,000
OTTAWA (Second Contract)	250,000	ENSCHEDE (HOLLAND)	150,000	GRAVESEND	300,000
BRANTFORD Remodelled)	200,000	BUENOS AYRES (RIVER PLATE CO.)	700,000	NEWPORT MON. (Second Contract)	250,000
		BURNLEY	1,500,000	TORONTO (Third Contract)	750,000
		KINGSTON-ON-THAMES	1,750,000		

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year of 1901-02; and they yielded an income of £388 more than the new supplies for the last-mentioned period. The volume of the new business was likely to be maintained for the present, if not increased at an accelerated rate, because the Company had sold more water to builders; and building operations in the Company's district—a great part of which had so far really been untouched by the builders—were by no means reaching completion. Moreover, the new methods of locomotion—electric tramways, light railways, and, he might say, motor omnibuses—would all tend to develop the Company's rural area of supply. The addition of a population estimated during the past year at 25,650 also showed the substantial nature of the Company's prospects. As the proprietors might imagine, this growth of business was naturally reflected in the capital account, on which in the past half year £41,681 was expended. This outlay was on the new main between Molesey and Ditton, the storage works at Molesey, additional filters at Ditton, and on the ordinary pipe extensions to enable the Company to meet this new business. The Molesey storage works, which would have cost over £200,000, were approaching completion; and the second of the two additional filter-beds at Ditton was now available for use. The main for conveying unfiltered water from the storage works at Molesey to the filtration works at Surbiton and Ditton would be completed, probably, within the next twelve months; and the only work in progress the completion of which could not yet be accurately forecast was the well at Selhurst. Notwithstanding the pressure of all this expenditure, and the development of the Company's district, it was certain that the capital outlay during the next three years would be much less than it had been in the past three years. The intercommunication main had been completed. It had not been fully paid for; but the money devoted to this purpose was quite sufficient for all charges connected with it. The revenue account was very satisfactory. It showed an increase in gross income of £5342 as compared with that for the corresponding period of last year; while the expenditure—excluding the payment to the Chamberlain of London—was £1021 less; making a total gain of £6363 on the half-year's trading. There was, however, an additional payment for losses, and also to the Chamberlain's fund; and this reduced the increase in the gross profit to £5304 as compared with that of the corresponding period of last year. As regarded the increases in the expenditure, an advance was shown, as usual, in the amount paid for rates and taxes—the increase this time being £861, as compared with the sum paid for the corresponding period of 1901-2. He might add that during the last ten years the amount paid by the Company for rates and taxes—exclusive of income-tax—had increased from £18,444 to £33,175 a year. This was an indication, he thought, of what was going on in this respect in the Metropolitan area. Filtration cost £421 more during the past half year. The decreases in expenditure had been mainly in the two items of pumping and engine charges and distribution of water. The decrease in the first of these items consisted mainly of some economy which had been effected in the cost of coal. The transfer of the Company's business to the Water Board made the contingency fund no longer necessary, and the Directors therefore proposed to place the whole of the amount to the dividend and interest account. The effect of the transfer would simply be to place to one account the balance of undivided profit. Like the other accounts, the dividend and interest account showed an improvement on the figures of the corresponding period of last year. The sum now transferred from revenue to dividend and interest account was £5396 more than it was at that time last year. However, the increased interest upon the issue of additional debenture stock reduced this amount; but after making this larger payment, the net profit available for dividend was £2128 more than it was at the end of March, 1902. The balance to be carried forward, exclusive of the contingency fund, would, however, be reduced by an increased payment to the Chamberlain of London of £3191. The proprietors would be gratified to learn from the Engineer's report that the Company's works and plant were in good and efficient working order. He had nothing to add to the statement in the report respecting the increase in the supply on the constant system. With reference to the claim of the Company for compensation for the transfer of their undertaking, the proprietors would agree with him that it would be unwise and impolitic to go fully into the matter. There were, however, some figures of interest which he thought he ought to mention, as they would show the progress which the Company were making, and which they would probably make in the next few years if they were to continue their existence. The figures in question were remarkable, and they dealt with the progress of the undertaking in the last ten years. The gross revenue for the year ended March 31 last was £336,359, as compared with £247,673 in 1893—an increase of £88,686. The cost of maintenance and management, of course, showed an increase, but nothing like the advance that had been made in their gross revenue. For the past year, the maintenance and management cost £143,806, compared with £89,629 in 1893—an increase of £54,177. The number of supplies at March 31 last was 127,486, compared with 96,261 at the same date in 1893; showing an increase of 31,225. The rate of dividend on the 10 per cent. capital had increased in the same interval from 9½ to 11 per cent. These figures did not really exhaust the progress made by the Company in the past ten years; for the expenditure last year, for instance, included nearly £3000 in connection with the London Water Bill, £1200 for the intercommunication scheme, and nearly £6300 as payments to the Chamberlain's sinking fund—making a total of £10,500 of absolutely new outlay last year, as compared with the expenditure which had to be incurred ten years ago. Moreover, he might say that the new business for the past six months was the largest recorded for any previous winter half year in the history of the Company. In point of fact, the proprietors would realize that the life of the Company was coming to an end just at the time when their prospects were at the brightest—a circumstance which it was to be hoped the Arbitrators would take into consideration in estimating the compensation payable to the Company. He concluded by moving the adoption of the report and accounts.

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Mr. JOHN BOUSTEAD seconded the motion, which was at once carried unanimously.

Resolutions were afterwards passed in order to transfer to the dividend and interest account the amount standing to the credit of the contingency fund; approving the dividends recommended for the half year, at the prescribed rates on the 10 per cent. and the 7½ per cent. stock, together with a payment on both descriptions of stock at the rate of 1 per cent. per annum on account of deficiences of previous dividends; and re-electing the retiring Directors and Auditor.

The SECRETARY, in acknowledging a vote of thanks to himself, the Engineer, and the other officers, stated that the progress which they had made in the past ten years had been in spite of many battles which they had had to fight. They had had to meet the attacks that had been made on them in Parliament; and two Royal Commissions had also had to be faced. Now they had to meet the Court of Arbitration. They had, however, survived all their past difficulties; and, speaking for himself and his colleagues, he could assure the proprietors that their best efforts would be directed to maintaining the interests of the Company as energetically as in the past, and, he trusted, with equal success.

A vote of thanks to the Chairman and Directors brought the meeting to a close.

NOTES FROM SCOTLAND.

From Our Own Correspondent.

Saturday.

It was a pleasant little ceremony which took place last Wednesday, when the new gas-works which have been erected for the Corporation of Newport, in Fifeshire, were formally inaugurated. Having regard to the situation of the new works, and to the circumstances generally, it was also an interesting ceremony. Gas-works that are set upon a hill cannot be hid any more than can a city. These very trim little works have been perched far up the slope which surmounts the rocky southern shore of the Firth of Tay, almost directly opposite their huge neighbour—and, it might have been, possible rival—in Dundee. There is a suggestion of sauciness in the small works looking down upon the large ones. Newport has declared for home rule in lighting matters; and it must be admitted that, having done so, the Municipality have followed up their resolution with an energy and an intelligence which are worthy of all credit. The old works occupied a site on the seashore, which was impossible of extension, and which was so small that every part of it was well within a stone's throw from any point. The new works stand in an acre-and-a half of land, with possibilities practically illimitable for many a day for extension. It was the first sign of intelligent management of the gas undertaking that immediately upon its coming into their hands, the Corporation appointed Mr. James M'Gilchrist, of Dumbarton, their Engineer. In such safe hands, it is not surprising that the Corporation have been able already to strike 7d. per 1000 cubic feet off the price of gas. Neither will it be matter of surprise if, with the magnificent works which he has provided them, they should be able to realize the expectation they cherish of still further reduction. There is nothing about the works which has not been tried. Thus the retort-settings are on Hislop's shallow regenerative system, which has produced such excellent results in so many gas-works of moderate size. There is no stoking machinery; but there is room for its introduction, should it be thought desirable. In fact, the only mechanical work about the place, besides the pumps, is Creeke's annular washer-scrubber—an apparatus which is finding much favour among gas managers, on account of its easy and efficient working, its low initial cost, and the facility with which it can be repaired. The works were thoroughly completed before they were opened. There is not a brick remaining to be laid, nor a road to be made. Mr. Black (the Manager) has had placed in his hands works which any manager might be proud to be in command of; and that the Corporation have every confidence in him was shown by the presentation which was made to him.

The negotiations between the Bridge of Earn Gas Company and the Town Council of Perth, for the supply of gas in bulk to the Company, having been completed and authorized by Provisional Order, the arrangement came into effect on Tuesday night, when the gas supply from Perth was turned on. The price of gas in Bridge of Earn is 6s. 3d. per 1000 cubic feet; and it is not expected that, the expense of laying a main from the new gas-works of the Perth Corporation at Friarton to the village having been considerable, there can be much reduction for some time. Under the arrangement, the Bridge of Earn Gas Company continue to supply gas in the village; and they will find their dividend in the difference between the price at which they buy the gas and that at which they sell it. They have resolved to abandon their works.

The Edinburgh and Leith Gas Commissioners held a monthly meeting on Monday. Among other things, they agreed to record their appreciation of the honour which had been conferred upon their President—Lord Provost Steel—by His Majesty the King, in creating him a baronet. Sir James Steel thanked the Commissioners for their congratulations upon his receiving so high an honour, which, however, he said he looked upon as having been conferred upon him on account of the high position occupied by the city, and not on account of his own merits.

A matter which was contained in the minutes of the previous meeting, and which the Commissioners agreed to without comment, was a rearrangement of the office staffs, arising out of a scheme which was foreshadowed by Mr. Herring in a report by him in July, 1901, regarding the reduction of the illuminating power of the gas. Mr. Herring then suggested that more attention should be paid to the consumption of gas, and that it would be advisable to put on, as surveyors of meters, handy men who would fit in burners free of charge to consumers.

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This has been found to work satisfactorily; and Mr. Herring has now obtained the sanction of the Commissioners to a scheme under which eight clerks out of 38 are to be transferred from the surveyors' to the consumers' clerks department, and the remaining surveyors are to be relieved of clerical work. It is expected that the new system, while facilitating work in the office, will allow of consumers' interests being attended to better; the class from whom surveyors are to be drawn being more that of gas-fitters than clerks.

In the report of the Directors of the Niddrie and Benhar Coal Company, Limited, they state that business has been fairly steady throughout the year; but it is significantly added that the only output which has not found a ready sale has been cannel coal, of which a considerable quantity has been added to stock. This is a remark which will doubtless be noted by gas managers who have not yet fixed their coal contracts for the year.

In a newspaper published in Perth, there appears a paragraph which, it is evident, is not without bias. It says: "For a considerable time past the question regarding the gas-stoves has been in abeyance. At a meeting of the Gas Committee on Monday night, however, the matter was again brought forward, and Bailie Hardie had a few hard knocks at the Gas Treasurer—Mr. Lindsay; while Councillor Macpherson, on the other hand, devoted his attention to saying equally hard things about the Gas Manager. For a time pandemonium reigned. As a result of the discussion, the Gas Manager was instructed to report on the working of the hiring department, as several members were evidently dissatisfied with the present arrangement." This is only one of the many surges which have of late reared their heads around the Perth Corporation gas undertaking; but, amid them all, Mr. M'Lusky's management stands firm as a rock.

At a meeting of the Gas and Electricity Committee of the Aberdeen Town Council on Wednesday, tenders for the supply of coal for the gas-works for the year were submitted, along with a report by the Gas Manager; and the recommendation of the Manager to purchase 62,000 tons at an average price of 16s. 3d. per ton, as compared with 17s. 1d. last year, was adopted.

The Aberfeldy Gas Company have had a successful year. At the annual meeting of the shareholders on Wednesday, a dividend at the rate of 4 per cent. was declared. It was resolved to retain the price of gas at the present figure, and to increase the salary of the Manager of the Company, Mr. James Clark.

An Improved Position at Brighouse.—The results of the past year's operations of the Brighouse Corporation Gas-Works are better than has been the case for some time past. Instead of the loss which was experienced the previous year, the balance-sheet shows a profit of £1592, besides which the public lamps have been lighted free of cost, It is intended to utilize this profit in reducing the adverse balance now standing against the department.

CURRENT SALES OF GAS PRODUCTS.

LONDON, *May* 29.

Tar Products.

The markets remain generally in the same position, and there is not much business doing. For pitch, there is still a fairly good inquiry from South Wales; but Continental buyers have evidently filled up their requirements for the present season, and are holding off the market, believing in lower prices forward. In Benzol, there appears to be a total absence of business. London distillers still quote 9d. for 90 per cent.; but it is reported that an offer of 8½d. was declined up to the end of the year from Continental consumers. As regards solvent and toluol, there is almost nothing doing, and prices remain stationary. The demand for crude carbolic continues steady; but consumers decline to pay any advance in price for prompt delivery, although there is little doubt they would entertain forward business if manufacturers would sell up to the end of the present year at existing prices. Creosote continues weak; and there is very little business doing. The position of anthracene remains precisely the same, and it is not likely that there will be any change for some time to come.

The average values during the week were: Pitch, London, 57s.; east coast, 53s. 6d. to 54s.; west coast, 52s. 6d. to 53s. Benzol, 90 per cent., 8¼d. to 8¾d.; 50-90 per cent., 7d. to 7¼d. Toluol, 7d. to 7¼d. Crude naphtha, 3d.; solvent naphtha, 7d. to 8d.; heavy naphtha, 9d. Creosote, London, 1⅜d.; North, 1⅛d. to 1¼d. Heavy oils, 2d. to 2 1/16d. Carbolic acid, 60 per cent., 1s. 6¼d. to 1s. 6½d. Naphthalene, 30s. to 45s.; salts, 21s. 6d. to 23s. 6d. Anthracene, "A" quality, 1⅜d. to 1⅞d.; "B" quality, 1d. nominal.

Sulphate of Ammonia.

There has been an absence of business during the past week, and prices have been decidedly easier; but there appears to have been more inquiry at the close. Beckton still quotes £12 15s. for June; but another large Gas Company would accept £12 12s. 6d. for the same period, although they have not very much to offer. Business has been done on Beckton terms at £12 10s. for early shipment. In Leith, there is really no actual business to report. Makers still ask £12 17s. 6d. to £13; but there are reported to be second-hand sellers at £12 15s. for prompt, and this is probably about the actual market value. In Hull, business has been done at £12 12s. 6d. for May-June; but consumers now offer only £12 10s., which sellers decline to accept. In Liverpool, the market is quiet, and there is very little doing. No doubt the approach of the holidays interferes with business generally; but undoubtedly there is an absence of Continental demand just at present.

The Directors of the European Gas Company, Limited, have decided to recommend, at the forthcoming meeting of shareholders, the payments of a final dividend of 12s. on the fully-paid shares, and 9s. on the £7 10s. paid shares, *plus* a bonus of ½ per cent.

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COAL TRADE REPORTS.

Lancashire Coal Trade.

Except that the Whitsuntide holidays are for the moment causing the usual dislocation of industrial operations in this district, there is very little change to notice with regard to the coal trade of Lancashire. A moderate business is being put through, with here and there some extra buying in anticipation of the holiday stoppages of the pits; but the general outlook of trade is anything but satisfactory, and the position as regards prices continues weak. Just now there is not much accumulation of surplus output; and probably stocks may be drawn upon to some extent during the pit stoppages. But when work is fully resumed, a very general resort to short time is regarded as practically certain. Considering the season of the year, house-fire coals have so far been moving off fairly well, with the prices steady at about recent quotations. Best qualities, such as Wigan Arley, range from 14s. up to 15s. per ton at the pit, second qualities from 11s. 6d. to 12s. and 12s. 6d., with the commoner sorts fetching from 10s. to 10s. 6d. and 11s. The lower descriptions of round coal still move off fairly well for iron-making, steam, and general manufacturing purposes; but there are plentiful supplies on the market, and prices are scarcely being firmly held to at full rates. Ordinary descriptions of steam and forge coal scarcely average more than 8s. 3d. to 8s. 6d. per ton; and it is only exceptional qualities which are fetching 8s. 9d. There is still extremely low cutting to secure shipping orders; special lots being offered at 9s. 3d. to 9s. 6d., with the ordinary quotations for good steam coal about 9s. 9d. to 10s. per ton, delivered at the ports on the Mersey. There is little or nothing further to report just at present with regard to gas coal contracts, beyond what was stated last week; but the reduced rates as compared with those of last year, already referred to, may be said to have been practically established as the basis for this year's supplies. Slack is plentiful. Common sorts average 4s. 3d. to 4s. 6d. per ton, medium qualities 5s. and 5s. 3d. to 5s. 9d., and best qualities 6s. 3d. and 6s. 6d. up to 6s. 9d., with some special sorts quoted 7s. per ton at the pit.

Northern Coal Trade.

After the completion of the great contracts for gas coals for the Metropolis, there has been a rather better feeling in the trade—possibly because these contracts remove so large a portion of the output from the market. In the steam coal trade, best Northumbrians are steady, with a fair demand, at about 10s. 9d. per ton f.o.b., second-class steams are quiet at from 9s. to 9s. 6d. (so that they are relatively lower than best), and steam smalls are firm at about 5s. 9d. In gas coals, there is a better export demand, both for the Baltic and the Mediterranean; and this, and the fairly good deliveries on contract, have taken up the production well. For occasional cargoes, the price is from 8s. 4½d. to 9s. per ton f.o.b., according to quality. In contracts, those for Stockton—some 30,000 to 35,000 tons yearly—are now practically settled, on terms similar to those of the larger contracts. The supply for one of the south-coast towns has also been arranged for, at prices from 8s. 3d. to 8s. 6d. per ton f.o.b. Gas coke generally is firm; the output being now limited. On Tyneside, prices vary from 12s. 3d. to 13s. per ton, f.o.b.; but they are firmer at some of the inland towns.

Scotch Coal Trade.

The coal market remains quiet, with prices still looking downwards, particularly for splint. Steam coal is also in less request than the season warrants. The prices quoted are: Main 8s. to 8s. 3d. per ton f.o.b. Glasgow, ell 8s. 6d. to 10s., and splint 9s. 3d. to 9s. 6d. The shipments for the week were 243,151 tons—an increase of 15,736 tons upon the previous week, but a decrease of 9644 tons upon the corresponding week of last year. For the year to date, the total shipments have been 3,956,079 tons—an increase of 113,631 tons upon the same period of last year.

Fatality at the South Metropolitan Gas-Works.—Last Tuesday morning, two men named Aspinal Shaw and Thomas Morrell, platers in the employ of Messrs. Clayton, Son, and Co., Limited, who had been hoisted in a cradle to do some repairs to a gasholder at the Kennington station of the South Metropolitan Gas Company, fell to the ground. Shaw was killed on the spot; and his companion died in the evening in St. Thomas's Hospital. An inquiry was opened by Mr. Troutbeck the next day; but, after evidence of identification and medical testimony had been given, it was adjourned for a fortnight for the report of the Factory Inspector.

Coventry Gas and Water Supply.—The annual statement of accounts of the Coventry Corporation Gas Department shows a net profit, after meeting all capital charges, of £4153. The Gas Committee propose to raise the limit of the reserve fund to £10,000 and add £2000 to it, to pay £2000 to the district fund, and to carry forward the balance of £153. They also propose a reduction in the price of gas to large consumers by continuing the present sliding-scale, so that consumers of a million cubic feet per quarter will be supplied at 2s. 3d., of 2½ millions at 2s. 2d., and of 4 millions at 2s. 1d. The water-works show a profit of £4902. It is proposed to pay over the usual sum of £3000 in aid of the borough fund.

Increase in the Price of Gas at Rhyl.—At a special meeting of the Rhyl Urban District Council last week, Mr. J. W. Jones, the Chairman of the Finance Committee, said they had closed the year £1503 better off than they anticipated. The net loss on the water undertaking was £393, as against £1426 estimated. The electric light business had substantially increased; but there was still a deficit of £932. The profit on the gas undertaking was £802. Taking the receipts from all sources, the amount was £35,307; while the expenditure was £35,204. The Committee recommended that, in order to make up for the deficits on the gas and electric light, they increase the price of gas 2d. per 1000 cubic feet and electricity ½d. per unit. These recommendations were agreed to.

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Cardiff Corporation Water-Works.—At the meeting of the Water Committee of the Cardiff Corporation last Tuesday week, a letter was read from the Local Government Board, consenting to borrowing powers to the amount of £97,956 for water-works. The chief works for which the money is required are a new service reservoir at Leckwith, to provide a better supply for Penarth, extensions at Cogan, a bye-pass from the Taff Vawr conduit to the Heath filter-beds, and a duplicate supply from the Ely pumping-station to supply water for sanitary purposes.

Price of Gas for Power Purposes at Leeds.—The Leeds Gas Committee have at present under consideration the question of supplying gas for motive power at a reduced rate. Various attempts have already been made to meet the wishes of manufacturers in this respect; but so far they have not been successful, and the Committee are now to make another attempt to solve the problem. At present, the price of gas for power is the same as that charged to the ordinary consumers. The Committee will, at the same time, consider if any steps can be recommended for reducing the price for ordinary purposes.

A New Reservoir for Rochdale.—Acting on the advice of Mr. J. Mansergh, a Sub-Committee of the Rochdale Water Committee have drawn up a lengthy report in which they recommend the construction of a second reservoir in the Ramsden Valley. An additional supply is not immediately needed; but in view of the steady increase in the demand, the Water Committee have for several years been looking out for new sources. Mr. Mansergh estimates that the new reservoir, which would supply 315,000 gallons daily, could be constructed for £72,000, which works out to a fraction over 6d. per 1000 gallons. The Heywood and Middleton Water Board offered water from their Ashworth Moor reservoir, when completed, at 6d. per 1000 gallons, with a payment of £1000 annually, whether the water was used or not. There was a short discussion on the report at the meeting of the Water Committee last Wednesday; and the matter was then adjourned for three weeks, by which time the members will have had an opportunity of mastering the questions raised.

The Opposition to the Torquay Water Bill.—A report was presented to the Newton Abbot Board of Guardians last Wednesday with reference to the successful opposition to the proposal of the Torquay Corporation to charge by meter for the supply of water to the workhouse. The Clerk (Mr. F. Horner) said that the decision of the House of Lords Committee in the matter was in accordance with the Board's contention that if an alteration was to be made in the law it should be done by a General Act, and not by a Private Bill. It had been stated in evidence before the Committee that there was a large increase in the consumption of water at the workhouse after the Corporation ceased to charge by meter; and it was suggested that this was largely waste. The consumption by meter in 1898 was 2,647,000 gallons, and the present consumption 4,500,000 gallons. As a matter of fact, the consumption was doubled between 1895 and 1898, and since 1898 there had been great additions to the workhouse, including new laundry, kitchen, dining-hall, and bakehouse. These accounted for the increased use of water. A vote of thanks was passed to the Clerk for the manner in which he had conducted the Guardians' case.

Letters of allotment for the recent issue of shares in the Wadhurst, Ticehurst, and District Gaslight and Coke Company, subscriptions for which were invited in the "JOURNAL" for the 19th ult., have been posted.

A gross profit of £8866 is reported on the past year's working of the Todmorden gas undertaking; and, despite extraordinary expenditure, there remained a net profit of £2211. Since the works were acquired in 1893, a total profit of £25,365 has been realized.

The annual local taxation returns just issued show that the local authorities of England and Wales received during the year 1900-1 sums amounting to £111,916,666; their expenditure being £110,384,912. The figures for 1899-1900 were £100,640,992 and £100,862,280.

Messrs. Joseph Taylor and Co., of Bolton, have in hand a saturator of their latest make for Messrs. C. & W. Walker, Limited, for the Dorking Gas Company; and they have also secured the contract for all lead work in connection with the new sulphate of ammonia plant to be erected for the Workington Corporation.

Tenders for the £200,000 of the East London Water Company's 3 per cent. debenture stock which were invited in our advertisement columns some weeks ago, were opened last Tuesday. The stock was applied for three times over, and allotted at prices ranging from £105 to £94 11s. per cent.; the average being £95.

At the last meeting of the Barnoldswick District Council, the Chairman of the Finance Committee stated that there had been a profit of £569 in the Gas Department, in the year ending the 31st of March, compared with £365 for the preceding twelve months. The result reflects credit on Mr. Harry Scott, the new Engineer and Manager.

The Directors of the Continental Union Gas Company, Limited, have decided to pay on the 4th prox. an interim dividend on the ordinary stock of 3 per cent., free of tax, for the half year (being at the rate of 6 per cent. per annum), together with the half-yearly dividend of 3½ per cent. on the preference stock—the latter less income-tax.

In the June number of "Cassier's Magazine," Mr. Frank C. Perkins suggests, as a solution of the Labour problem, that the Trade Unionists among the labouring classes should, through their representatives, gradually acquire shares or stock in the industrial enterprises with which they are identified, so as to ultimately represent important interests, with a voice in the management of the businesses. Labour's capital, so invested, would, Mr. Perkins thinks, serve immeasurably more efficiently in the interests of labour than if paid into strike funds, and moreover would lead to industrial peace and harmony all round.

Under the auspices of the Gainsborough Urban District Council, a successful exhibition of gas cooking, heating, and lighting appliances, was recently held in the Town Hall. The exhibition was opened by Mr. J. Barlow, the Vice-Chairman of the Council. Messrs. John Wright and Co., of London and Birmingham, supplied the stoves; and Miss Weston gave cookery lectures each afternoon and evening. The hall was brilliantly illuminated by means of three Lucas lamps, each of 700-candle power, which were much admired. The arrangements were under the superintendence of Mr. J. Baldwin, the Gas Manager. Messrs. Wright and Co. have also held exhibitions lately at Peterborough (with lectures by Miss Silvester) and Holywood (with lectures by Miss Miles).

The Somzée-Greyson Intensified Gas-Light Syndicate, Limited, have issued their price list for 1903; and it must be said that it has been got up in a very interesting style. It only covers some twelve pages, in which tables are given showing the estimated saving by the adoption of the system—high and ordinary pressures—as compared with common gas-burners, with gas at 3s. and 2s. 6d. per 1000 cubic feet; descriptive information as to their high-pressure system and intensified burners for ordinary gas pressures, with illuminating results; and prices and illustrations. The Syndicate, it is clear, are going to depend for success on the high quality of their goods; and, moreover, it may be noted that all their burners are being made to carry what is termed "C" glass, so as to preserve uniformity throughout. Publishing so fully the figures as to the performance of their burners shows that the Syndicate are prepared to stand by them under comparable conditions.

WANTED, FOR SALE, CONTRACT, &c., ADVERTISEMENTS IN THIS WEEK'S "JOURNAL."

Situations Vacant.

CLERK. Normanton Gas Company. June 10.
CLERK AND COLLECTOR. No. 4042.
DRAUGHTSMAN. C. & W. Walker, Donnington.
GAS-FITTER Banbury Gas-Works.
MANAGER. Halifax Gas Department. June 9.
MANAGER. Kirkcaldy Gas Company.
SERVICE LAYERS AND FITTERS. Mitcham, &c., Gas Company.

Situations Wanted.

CLERK, &c. No. 4033.
GAS MANAGER, &c. No. 4037
TRAVELLER GAS ENGINEERING FIRM. No. 4032.

Agent Wanted for Gas-Stoves. No. 4040.

Meeting of Company.

CHELSEA WATER COMPANY. June 25.

Sales of Stocks and Shares.

ALDEBURGH GAS COMPANY. June 17.
BARNET GAS AND WATER COMPANY. June 9.
BOURNEMOUTH GAS AND WATER COMPANY. June 9.
BRIGHTON AND HOVE GAS COMPANY. June 9.
COLNEY HATCH GAS COMPANY. June 17.
CROYDON GAS COMPANY. June 16.
FELIXSTOWE GAS COMPANY. June 6.
GAS METER COMPANY. June 9.
GORING AND STREATLEY GAS COMPANY. June 17.
HARTLEPOOL GAS AND WATER COMPANY. June 11.
HASTINGS AND ST. LEONARDS GAS COMPANY. June 9.
HORLEY GAS COMPANY. June 17.
LAMBETH WATER COMPANY. June 22.
MALTA, &c., GAS COMPANY. June 16.
PORTSEA ISLAND GAS COMPANY. June 16.
SOUTH ESSEX WATER COMPANY. June 16.
TONBRIDGE GAS COMPANY. June 16.
WEST HAM GAS COMPANY. June 16.

Plant, &c., for Sale.

CONDENSERS, SCRUBBERS, BOILERS, STATION METER, EXHAUSTER, ENGINES, AND PURIFIER. Slough Gas Company.
ENGINES (Gas and Steam), GAS PLANT, PUMPS, WEIGHBRIDGES, &c. Redhill Water-Works.
PURIFIERS AND STATION GOVERNOR, &c. Walton Workhouse, Liverpool.
SCRUBBER, WASHER, STATION METER, EXHAUSTER, TANKS, CONDENSERS, MOUTHPIECES, LANTERNS, &c. Longwood Gas Company.

Plant (Second-Hand) Wanted.

WASHER-SCRUBBER. Holywood Gas Company.

TENDERS FOR

Ammoniacal Liquor (*See* "Tar").

Benzol.

LEIGH (LANCS.) CORPORATION. Tenders by June 13.

Coal and Cannel.

BIRMINGHAM GAS DEPARTMENT. Tenders by June 9.
BRIDGNORTH GAS DEPARTMENT. Tenders by June 15.
BURY GAS DEPARTMENT. Tenders by June 13.
CARDIFF GAS COMPANY. Tenders by June 25.
DONCASTER GAS DEPARTMENT. Tenders by June 12.
GLYNCORRWG GAS DEPARTMENT. Tenders by June 10.
HALIFAX GAS DEPARTMENT. Tenders by June 10.
HAYWARDS HEATH GAS COMPANY. Tenders by June 5.
HEBDEN BRIDGE. Tenders by June 6.
HEYWOOD GAS DEPARTMENT. Tenders by June 16.
HINDLEY GAS DEPARTMENT. Tenders by June 15.
HOLBEACH GAS COMPANY. Tenders by June 11.
HUDDERSFIELD GAS DEPARTMENT. Tenders by June 10.
LAMBETH WATER COMPANY. Tenders by June 9.
LANCASTER GAS DEPARTMENT. Tenders by June 12.
LEAMINGTON PRIORS GAS COMPANY. Tenders by June 23.

Coal and Cannel—(*Continued*)

LEIGH (LANCS.) CORPORATION. Tenders by June 13.
LEIGH-ON-SEA GAS DEPARTMENT. Tenders by June 11.
LITTLEBOROUGH GAS COMPANY. Tenders by June 20.
MALTON GAS COMPANY. Tenders by June 13.
MARKET HARBOROUGH GAS DEPARTMENT. Tenders by June 27.
MIDDLETON GAS DEPARTMENT. Tenders by June 10.
MOLD GAS COMPANY. Tenders by June 30.
NEWBURY GAS DEPARTMENT Tenders by June 12.
NEW MILLS GAS DEPARTMENT. Tenders by June 15.
PAIGNTON GAS COMPANY. Tenders by June 6.
PONTYPRIDD GAS DEPARTMENT. Tenders by June 8.
PORTLAND GAS DEPARTMENT. Tenders by June 18.
ROTHWELL GAS DEPARTMENT. Tenders by June 15.
SEDGLEY GAS DEPARTMENT. Tenders by June 4.
SEVENOAKS GAS COMPANY. Tenders by June 9.
SHREWSBURY GAS COMPANY. Tenders by June 13.
SLOUGH GAS COMPANY. Tenders by June 9.
STOKE-ON-TRENT GAS DEPARTMENT. Tenders by June 10.
WIRKSWORTH GAS COMPANY. Tenders by June 15.

General Stores, Lead Piping, &c.

LEIGH (LANCS.) CORPORATION. Tenders by June 13.

Lime.

LEIGH (LANCS) CORPORATION. Tenders by June 13.

Meters.

LEIGH (LANCS) CORPORATION. Tenders by June 13.

Pipes and Fittings, &c.

LEIGH (LANCS.) CORPORATION. Tenders by June 13.

Sulphuric Acid.

LEIGH (LANCS.) CORPORATION. Tenders by June 13
MARKET HARBOROUGH GAS DEPARTMENT. Tenders by June 27.

Tar and Ammoniacal Liquor.

NEW MILLS GAS DEPARTMENT. Tenders by June 1.

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No notice can be taken of anonymous communications. Whatever is intended for insertion in the "JOURNAL" must be authenticated by the name and address of the writer; not necessarily for publication, but as a proof of good faith.

COPY FOR ADVERTISEMENTS for the "JOURNAL" should be received at the Office NOT LATER than TWELVE O'CLOCK NOON ON MONDAY, to ensure insertion in the following day's issue.

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ROTTERDAM.

General Manager for England and Wales)—
CHARLES E. FRY, LEAMINGTON; and at Tower Chambers, Brown Street, MANCHESTER.

London Managers—
E. PADFIELD & CO., 96-98, Leadenhall Street, LONDON, E.C.

General Manager (for Scotland)—
J. B. MACDERMOTT, 11, Bothwell St., GLASGOW.

AMMONIACAL LIQUOR wanted.

BROTHERTON AND CO., LTD., Ammonia Distillers.
Works: BIRMINGHAM, LEEDS, and WAKEFIELD.

JOHN RILEY & SONS, Chemical Manufacturers, Hapton, near Accrington, are MAKERS of Special SULPHURIC ACID, for Sulphate of Ammonia Making. Highest percentage of Sulphate of Ammonia obtained from the use of this Vitriol, which has now been used for upwards of 50 Years. References given to Gas Companies.

THE EVERSON COAL AND COKE COMPANY LIMITED, BIRMINGHAM,

ASK for Prices of Gas Coke in any quantities, delivered into waggons at Sellers' Station.

GAS-METERS wanted, old disused Wet.

Copper Lamp Frames, Brass, Pewter, Tin, Zinc, Lead Ashes, Old Copper Electric Cable, &c., for Cash.

J. SMITH, Canal Road, BRADFORD.

TO GAS AND WATER OFFICIALS.

COURT ROYAL CYCLES are largely supplied to Public Officials. Specially REDUCED PRICES to GAS MANAGERS and ASSISTANTS where unrepresented. See and test one of these sterling high-grade Manufactures before deciding upon any new purchase. Large Catalogue, Books of Testimonials, and Special Prices sent, on application, from the Makers LLOYD COURTS AND CO., COVENTRY.

AMMONIACAL Liquor wanted by JOHN RILEY & SONS, Hapton, near ACCRINGTON.

TRAVELLER is shortly Open to an ENGAGEMENT with a firm of Gas Engineers and Contractors. Extensive connection and can introduce good business.

Address No. 4032, care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

SON of a Gas Manager, thoroughly experienced in Gas Manufacturing, also well trained in all branches of Electrical Engineering, would like a situation at home or abroad. Educated in three different Languages.

Address, No. 4037, care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

A GENTLEMAN (Age 30), with Twelve Years' experience in a leading Gaslight Company—Correspondence (Shorthand), Rentals, Stock Ledgers, Transfers, Shares, Board Records, Dividends, &c., &c.—desires an APPOINTMENT in or about London. Highest Testimonials. Personal References Salary £100 per annum. One Month's Approbation.

Address No. 4033, care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

AGENT Wanted by a large Firm of Ironfounders, who have recently started to manufacture Gas-Stoves. An existing connection with Gas Companies essential.

Apply, stating Qualifications, &c., to No. 4040, care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

GAS-FITTER.

WANTED, a steady young Man competent to do General Gas-Fitting and maintain Incandescent Gas-Burners—Indoor and also in the Public Lamps.

Apply, stating Age and Wages, to the GAS COMPANY, Banbury, OXON.

COAL GAS TAR wanted.

Gas Managers in Gloucester, Somerset, Worcester, Devon, Wilts, Hereford, Monmouth, and Glamorgan PLEASE NOTE. BEST PRICE offered, either on Fixed or Sliding-Scale Basis.

State Quantity to offer for Prompt and Forward Delivery.

The SHARPNESS CHEMICAL COMPANY, Tar Distillers, Sharpness Docks, GLOS.

OXIDE OF IRON.

(NATURAL.

BALE & CHURCH will be pleased to send Samples and Quotations, and make Offers for SPENT OXIDE.

BALE'S FIRE CEMENT, PAINT, AND GAS COAL.

5, CROOKED LANE, LONDON, E.C.

DRAUGHTSMAN Wanted, thoroughly familiar with Gasholders and General Gas-Works Plant, and capable of making Working Drawings and taking out Quantities for estimating or ordering Materials.

State Age, Experience, and Salary required, to C. & W. WALKER, Limited, Midland Iron-Works, Donnington, SHROPSHIRE.

WANTED, by the Normanton Gas Company, a smart Young Man as CLERK, with good knowledge of Gas-Works Accounts.

Apply, stating Age, Experience, and Salary required, and enclosing Two Testimonials, to the undersigned on or before June 10.

E. H. HUDSON,
Secretary and Manager.

WANTED, several thoroughly Competent SERVICE LAYERS and FITTERS. Must be Experienced in Stove and Meter Fixing, &c.

Also GAS-FITTERS, experienced in fitting up Slot Installations and Incandescent Burners and the usual Outdoor Fitting Work of a Gas Company.

Apply, with References, stating age, Experience, and Wages expected, to the ENGINEER Gas-Works, MITCHAM.

KIRKCALDY GASLIGHT COMPANY, LIMITED.

WANTED, a Manager for the above Company to take entire charge of their Works. Must have a knowledge of Regenerative Settings. Salary to commence with £325.

The new Manager is wished to enter on his duties not later than the 31st of August.

Applications, with twelve *copies* of Testimonials, to be lodged with the undersigned not later than the 20th of June. Any canvassing of Directors will disqualify for appointment.

WM. L. MACINDOE,
Secretary.

170, High Street, Kirkcaldy,
May 29, 1903.

WANTED, immediately, by a Gas Company within Twenty Miles of London, a young Man as CLERK and COLLECTOR. The person appointed must devote the whole of his time to the service of the Company. He must be smart and of obliging manner, and have some knowledge of Incandescent Burners and Cooking-Stoves, to be able to generally advise consumers in their use.

Commencing Salary, 30s. per week.

Unexceptionable References and satisfactory guarantee required. The premium would be paid by the Company.

Applications, in Candidate's Handwriting, stating Age, if and how at present occupied and how soon he would be disengaged, and accompanied by *copies* (which will not be returned) of two recent Testimonials, to be addressed to No. 4042, care of Mr. King, 11, Bolt Court, FLEET STREET, E.C., not later than the 5th of June cur.

COUNTY BOROUGH OF HALIFAX.

THE Corporation of Halifax invite APPLICATIONS for the appointment of GAS-WORKS MANAGER. Candidates must be capable of dealing with the Residual Products, and possess a thorough knowledge of Chemistry.

Commencing Salary, £500 per annum.

Candidates must not be over 40 years of age.

Applications, endorsed "Gas-Works Manager," stating Age, Qualifications, and Particulars of Experience (with *copies* of not more than Three Testimonials), to be sent to the undersigned on or before Tuesday, June 9, 1903.

Canvassing prohibited.

By order,
KEIGHLEY WALTON,
Town Clerk.

Town Hall, Halifax,
May 28, 1903.

WASHER-SCRUBBER wanted, capable of dealing effectually with about 250,000 cubic feet of gas per day.
Send Particulars to the HOLYWOOD GAS COMPANY, LTD, Co. Down.

TO BE SOLD—Purifiers, Two or Four, 10 feet square by 4 ft. 6 in. deep, planed Joints, Connections, and Overhead Girders.
Write J. WRIGHT, 181, QUEEN VICTORIA STREET, E.C.

SULPHATE of Ammonia Plant Repairs, &c., done by new Patent Machines, and upon the cheapest rate and quickest notice. Workmanship Guaranteed. Distance no object.
DAVIES, 78, EARL'S COURT ROAD, W.

FOR SALE—Four Purifiers, 6 feet square, by 2 ft. 10 in., complete with 6-inch Connections, Dry Centre-Valve, Bearing-Bars, Wood Grids, and Lifting Screws for Covers. All in excellent condition, and ready for removal.
Also one 8-inch STATION GOVERNOR.
Apply, MASTER, Walton Workhouse, LIVERPOOL.

SEVERAL Years' Numbers of Proceed- ings of the Society of Chemical Industry, and the "Analyst"—some intermediate numbers missing. What Offers?
Address No. 4041, care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

GAS PLANT for Sale—I can always offer NEW and SECOND-HAND GAS APPARATUS, including Retorts and Fittings, Condensers, Exhausters, Scrubbers, Washers, Purifiers, Gasholders, Tanks, Valves, Connections, &c. Also a few COMPLETE WORKS. Compare Prices and Particulars before ordering elsewhere.
J. F. BLAKELEY, Gas Engineer, Thornhill, DEWSBURY.

FOR SALE.

A TWIN 16-Horse Power Crossley Otto GAS-ENGINE; Dowson GAS PLANT; Two sets of Deep-Well PUMPS; Horizontal Tandem Compound Condensing ENGINE, with double-acting Pump; Two double acting FORCE PUMPS; double Bucket WELL PUMPS; and Four Cart WEIGH BRIDGES.
For Particulars, apply to WATER-WORKS OFFICE, Redhill, SURREY.

SLOUGH GAS AND COKE COMPANY.

THE Directors have the following PLANT FOR SALE (in whole or in part), owing to the Company's removal to their New Works.
Two ANNULAR CONDENSERS, 2 ft. by 20 ft.
One SCRUBBER, 20 ft. high by 5 ft. diameter, with 8-inch Valves and Connections.
HYDRAULIC MAINS, Eight 16 in. by 16 in. with 8-inch Valves and Connections and 5-inch Ascension Pipes and Dips.
One Egg-Ended BOILER, 10 ft. 6 in. by 4 ft.
One " " 9 ft. by 3 ft. 6 in.
One 8000 cubic feet per hour STATION METER, with 8-inch Valves and Connections.
One 10,000 cubic feet per hour EXHAUSTER.
One 5000 " " "
One 5-Horse Power ENGINE.
One 3-Horse Power "
Three PURIFIERS, 12 ft. by 12 ft. by 5 ft.
The above can be seen by appointment with Mr. T. C. Webb, Engineer and Manager, Gas-Works, Slough, Bucks.
ARTHUR THOMAS, Secretary.
High Street, Slough,
May 28, 1903.

GAS PLANT FOR SALE.

OWING to the acquirement of the Works of the Colne Vale Gas Company, and the closing down of these Works, the Longwood Gas Company have FOR SALE the following PLANT in good condition:—
One HOLMES' TOWER SCRUBBER, 5 ft. by 12 ft., mounted on Thurston's Square Tar-Extractor, 5 ft. 6 in. by 5 ft.
One HOLMES' WASHER, cylindrical, 16 ft. by 4 ft. 6 in., with Rope Driving Gear and Shaft.
One COWAN CYLINDRICAL STATION METER, measuring 6 ft. 6 in. by 6 ft., with 12-inch Connections; capacity 10,000 feet per hour.
One 5000 cubic feet per hour EXHAUSTER, with Accessories and Engine in duplicate.
One 500-light STATION METER.
One Wrought-Iron Cylindrical STORAGE TANK, 26 ft. by 7 ft.
One Cast-Iron STORAGE TANK, 6 ft. 6 in. by 5 ft. by 5 ft., with Cast-Iron Draw-Off Cock.
Six Cast-Iron CONDENSERS, each 9 ft. 6 in. high, and 2 ft. diameter, with square base, 17 ft. by 3 ft by 1 ft. 3 in., fitted with Cleaning-Out Lids for each Pipe.
The following MOUTH-PIECES, with Ascension and Dip Pipes to suit:—
28 OVALS, 18 in. by 14 in.
Seven OVALS, 18 in. by 15 in.
27 □ 21 in. by 15 in.
Two Cast-Iron SLAKING TROUGHS, 4 ft. by 2 ft. 6 in. by 2 ft.
Also 100 Second-hand STREET LANTERNS.
Inspection invited.
Further Particulars on application to
J. H. BREARLEY, Gas Engineer.
Longwood.

WIRKSWORTH GASLIGHT AND COKE COMPANY, LIMITED.

THE Directors of the above Company are prepared to receive TENDERS for the supply of about 900 Tons of screened GAS COAL from the 1st of July next.
Sealed Tenders will be received up to June 15.
S. HALSTEAD, Secretary and Manager.
22, 1903.

THE

Institution

OF

Gas Engineers.

THE

ANNUAL GENERAL MEETING

WILL BE HELD ON

TUESDAY (10.30 a.m.),
WEDNESDAY (10 a.m.), and
THURSDAY (10 a.m.)

June 9th, 10th, and 11th,

AT THE

INSTITUTION OF MECHANICAL ENGINEERS,

STOREY'S GATE, ST. JAMES'S PARK, WESTMINSTER, S.W.,

By kind permission of the Council of that Society.

THE CHAIR WILL BE TAKEN BY THE PRESIDENT,

ANDREW DOUGALL, jun., Esq.,
OF TUNBRIDGE WELLS.

In connection with the Meeting, an EXCURSION to Eastbourne has been arranged for Friday, 12th June. Full Particulars are announced in the Programme.

THE BENEVOLENT FUND.

The Annual General Meeting of the Contributors to the Benevolent Fund will be held on Wednesday, 10th June, at 10 a.m.
WALTER T. DUNN, Secretary.
39, *Victoria Street, Westminster.*

URBAN DISTRICT COUNCIL OF PONTYPRIDD.
(GAS DEPARTMENT.)

THE Gas Committee of the above Council are prepared to receive TENDERS for the supply of 11,000 Tons of GAS COAL for the Twelve Months ending June 30, 1904.
Tender Form, with Specification, may be obtained on application to Mr. Edward Jones, Gas Engineer, Treforest.
Tenders, endorsed "Gas Coal," must be received by the undersigned not later than June 8, 1903.
J. COLENSO JONES, Solicitor and Clerk to the Council.
Council Offices, Pontypridd,
May 20, 1903.

CARDIFF GASLIGHT AND COKE COMPANY.

TENDERS FOR COALS.

THE Directors of the above Company are prepared to receive TENDERS for a supply of 80,000 Tons of Best Well-Screened Large GAS COALS, to be delivered between the 1st of July, 1903, and the 30th of June, 1904, in monthly quantities in accordance with the Specification.
Parties tendering may do so for the whole quantity, or for quantities from 5000 tons upwards.
Forms of Tender and Specification of monthly deliveries may be obtained on application to the Engineer and Manager, Mr. H. Morley, M.Inst. C.E.
Sealed Tenders to be sent to the undersigned not later than Ten a.m. on Thursday, the 25th day of June next, addressed to the Chairman of the Company, endorsed "Tender for Coal."
The Directors do not bind themselves to accept the lowest or any Tender, and reserve to themselves the right to apportion the whole quantity as they may think fit.
By order,
GEORGE CLARRY, Secretary.
Gas Offices, Cardiff,
May 16, 1903.

HAYWARDS HEATH DISTRICT GAS COMPANY.

GAS COAL.

THE Directors of the above Company invite TENDERS for the supply of about 3700 Tons (more or less) of GAS COAL, to be delivered in such quantities and at such periods as may be ordered between the 1st of July, 1903, and the 30th of June, 1904.
The Coal required is to be unscreened, and to be delivered, in Trucks, free at the Haywards Heath Railway Station (London, Brighton, and South Coast Railway) in good and dry condition, either from the South Yorkshire or Durham Coal-fields.
Payments, net cash monthly.
Tenders are to state the name of the Pits from which the above description of Coal will be supplied; the same to be fresh wrought and free from Slate, and to the entire satisfaction of the Company's Manager.
Each delivery to be accompanied by a Certificate stating place of origin and railway weight of each truck.
The Board have no special Form of Tender, and do not bind themselves to accept the lowest or any Tender.
Tenders are to be received by me on or before the 5th day of June next, and endorsed "Tender for Gas Coal."
(Signed) RUSSELL CORY, Secretary.
85, Gresham Street,
London, E.C.

TAR Contracts Wanted on the Sliding- Scale or at Fixed Prices.
Managers and Secretaries desirous of selling to best advantage please communicate with DENT AND CO., Ouse Chemical Works, SELBY.

TENDERS FOR COAL.

THE Directors of the Mold Gas and Water Company are prepared to receive TENDERS for the supply of about 1500 Tons of GAS COAL or NUTS, to be delivered at the Company's Siding during the Twelve Months ending June 30, 1904, in such quantities and at such times as the Manager shall from time to time direct.
Tenders, endorsed "Coal," to be delivered to the undersigned not later than June 20.
JAMES MACGREGOR, Secretary and Manager.
Gas and Water Offices, Mold.

LITTLEBOROUGH GAS COMPANY.

TENDERS FOR GAS COAL.

THE Directors invite Tenders for the supply of 4000 Tons of screened GAS COAL, and 2000 Tons of GAS SLACK, to be delivered at Littleborough Station (L. & Y.), in quantities as required during the period from July 1, 1903, to June 30, 1904.
The Directors reserve the right to accept Tenders for the whole or any portion of the quantity offered, and do not bind themselves to accept the lowest or any Tender.
Tenders, endorsed "Tender for Coal," to be sent not later than June 20, 1903.
No special Form of Tender issued.
S. E. HALLIWELL, Manager and Secretary.
Gas-Works, Littleborough,
May 29, 1903.

COUNTY BOROUGH OF HALIFAX.

THE Gas-Works Committee of the Halifax Corporation invite TENDERS for the supply of 40,000 Tons of GAS COAL, to be supplied in such quantities as may from time to time be determined by the Gas-Works Committee during the Year ending the 30th of June, 1904.
Forms of Tender and further Information may be obtained on application to the Manager, Gas-Works, Halifax.
Tenders, endorsed "Coal," must be sent to the undersigned not later than Ten o'clock a.m., on Wednesday, the 10th of June, 1903.
The Committee do not bind themselves to accept the lowest or any Tender.
By order,
KEIGHLEY WALTON, Town Clerk.

SLOUGH GAS AND COKE COMPANY.

THE Directors are prepared to receive TENDERS for the supply of 5000 Tons of either of the following GAS COALS—viz.: East Pontop, Ravensworth Pelaw, Pelaw Main, Londonderry, New Pelton, Aldwarke Silkstone, Best Yorkshire Silkstone ex Thorncliffe Collieries, or of any other description of good Gas Coal, to be delivered at Nash's Siding on the Great-Western Railway Station at Slough, in the usual Monthly Quantities as may be required during the period of One Year from the 1st of August, 1903.
Payments for Coal on or before the 20th of the following month after delivery.
Tenders, to be delivered to the undersigned, endorsed "Tender for Gas Coal," on or before Tuesday, the 9th prox.
The Directors do not bind themselves to accept the lowest or any Tender.
ARTHUR THOMAS, Secretary.
High Street, Slough,
May 28, 1903.

PAIGNTON GAS COMPANY.

TENDERS FOR GAS COAL.

THE Directors of the Paignton Gas Company are prepared to receive TENDERS for the supply of about 3600 tons (or such other quantity as may be agreed on) of best approved GAS COALS, to be delivered in such monthly quantities as may be required by the Company.
Tenders to state the price of the Coal delivered at Paignton Station, Great Western Railway, free of all charges.
The Directors do not bind themselves to accept the lowest or any Tender.
Further particulars may be obtained on application to Mr. C. G. Dawson, the Company's Manager.
Sealed Tenders, endorsed "Tender for Coal," specifying the description and quality of coal, to be sent on or before the 6th of June, addressed to the undersigned, Gas Offices, 1A, Victoria Street, Paignton.
F. W. PUDDICOMBE, Secretary.
Paignton, May 19, 1903.

GLYNCORRWG URBAN DISTRICT COUNCIL.
(GAS-WORKS).

TENDERS FOR COAL.

THE above Council invite Tenders for the supply and delivery of about 700 Tons, more or less, of the Best Large GAS COAL, to be delivered in such quantities as may be required from time to time during the Twelve Months ending the 31st of May, 1904.
Tenders to quote price per ton, carriage paid to the Gas-Works Siding near Cymmer, Rhondda and Swansea Bay Railway.
Sealed Tenders, endorsed "Gas Coal Tender," specifying the description of Coal offered, and Pits and Veins from which raised, to be sent to us not later than Wednesday, the 10th of June.
The lowest or any Tender not necessarily accepted.
The Council will require a contract to be signed on acceptance of Tender.
CUTHBERTSON AND POWELL, Clerks to the Council.
Water Street, Neath,
May 19, 1903.

TO COAL MERCHANTS

THE Directors of the Lambeth Water-

Works Company are prepared to receive TENDERS for such quantities of Welsh and North Country COAL as they may require during Six or Twelve Months (at the option of the Company) commencing on the 1st of July next.

The Coal is to be delivered alongside the Company's Works at Molesey and Surbiton, and into their Stores at Brixton Hill, free of all charges in each case.

Conditions and Forms of Tender may be obtained at the Company's Office, Brixton Hill, and Tenders are to be delivered, under cover, endorsed "Tender for Coal," to the undersigned not later than Ten o'clock in the morning of Tuesday, the 9th day of June, 1903.

The Company do not bind themselves to accept the lowest or any Tender.

H. WILKINS,
Secretary.

Lambeth Water-Works,
Brixton Hill, London, S.W.
May 12, 1903.

BRIDGNORTH CORPORATION GAS-WORKS.

TO COLLIERY PROPRIETORS AND OTHERS.

THE Gas Committee are prepared to receive sealed TENDERS for the supply of GAS COAL, including carriage to the Bridgnorth Railway Station, for One Year from or soon after the end of July next.

Evidence as to quality of Coal must accompany each Tender.

Quantity required: About 2200 Tons to 2500 Tons in proportionate deliveries as directed—say, 70 per cent. during Winter Months, and 30 per cent. during Summer Months.

Sealed and marked Tenders must be sent to the undersigned not later than Monday, the 15th of June.

The Committee reserve to themselves the right to divide the quantity into two or more Contracts, and do not bind themselves to accept the lowest or any Tender.

Official Forms for Tender are not furnished.

By order,
J. H. COOKSEY,
Town Clerk, Secretary.

Bridgnorth,
May 29, 1903.

COUNTY BOROUGH OF HUDDERSFIELD.

TENDERS FOR GAS COAL AND NUTS.

THE Gas Committee are prepared to receive TENDERS, from Colliery Proprietors only, for the supply and delivery of about 60,000 Tons of unscreened GAS COAL and screened NUTS for a period of Twelve Months, commencing the 1st of July, 1903.

Full Particulars and Form of Tender may be obtained on application to the Gas Engineer and Manager, Leeds Road, Huddersfield.

Sealed Tenders, endorsed "Tender for Gas Coal," must be delivered free of charge, addressed in the handwriting of the Tenderer or his Agent, to the Town Clerk, Town Hall, Huddersfield, not later than Twelve o'clock noon on Wednesday, June 10, 1903.

The Corporation do not bind themselves to accept the lowest or any Tender.

By order,
J. HENRY FIELD,
Town Clerk.

Town Hall, Huddersfield,
May 28, 1903.

BOROUGH OF LEIGH.

(GAS AND WATER DEPARTMENTS)

THE Gas and Water Committee of the above Corporation are prepared to receive TENDERS for the supply of the following goods:—

1—14,000 Tons of Screened Arley GAS COAL.
2—400 Tons of CANNEL.
3—Wrought-Iron TUBES and FITTINGS.
4—LEAD PIPE.
5—GAS-METERS.
6—VITRIOL.
7—LIME.
8—BENZOL.

Forms of Tender and further Particulars may be obtained on application to Mr. James Gibson, Gas and Water Manager, Leigh.

Sealed and endorsed Tenders must be delivered to the undersigned on or before Twelve o'clock noon on Saturday, the 13th day of June next.

The Corporation do not bind themselves to accept the lowest or any Tender, and reserve to themselves the right to divide any Tender.

By order,
PEREGRINE THOMAS,
Town Clerk.

Town Hall, Leigh, Lancs.,
May 27, 1903.

MARKET HARBOROUGH URBAN DISTRICT COUNCIL.

(GAS DEPARTMENT.)

TENDERS FOR GAS COAL AND SULPHURIC ACID.

THE Gas Committee invite Tenders for

GAS COAL.

The supply of the whole or part of 3700 Tons of best screened GAS COAL or NUTS, to be delivered as may be required during the Year ending June 30, 1904, at the Sidings of the London and North-Western or Midland Railway Station, Market Harborough.

SULPHURIC ACID.

The supply of SULPHURIC ACID, to be delivered in Senders' Carboys, at Market Harborough Station, as may be required during the Year ending June 30, 1904.

Conditions and Form of Tender may be obtained from the undersigned, to whom sealed Tenders, endorsed "Coal" and "Sulphuric Acid" respectively, must be delivered not later than Saturday, the 27th day of June, 1903.

The lowest or any Tender not necessarily accepted.

A. T. HARRIS,
Manager and Secretary.

Gas Office: St. Mary's Road,
Market Harborough, May 29, 1903.

CITY OF BIRMINGHAM.

(GAS DEPARTMENT.)

TENDERS are invited for the supply of 493,000 Tons of GAS COAL to the Corporation Gas-Works, between the 1st day of July, 1903, and the 30th day of June, 1904.

Forms of Tender, which must be returned on or before the 9th day of June next, can be obtained, with full Particulars, on application.

G. HAMPTON BARBER,
Secretary.

Council House, Birmingham,
May 29, 1903.

TENDERS FOR GAS COAL.

THE Corporation Gas Committee of Stoke-upon-Trent invite TENDERS for the supply of 12,000 Tons of GAS COAL.

Specification and Form of Tender may be obtained on application to the undersigned, or at the Gas Offices.

Tenders to be sent in not later than Twelve o'clock noon on the 10th day of June, 1903, addressed to F. Geen, Esq., J.P., Chairman of the Gas Committee, Stoke-upon-Trent, and endorsed "Tender for Gas Coal."

WM. PRINCE,
Engineer and Manager.

Gas Offices, Stoke-upon-Trent,
May, 1903.

THE Corporation of Middleton are pre- pared to receive TENDERS for the supply of 8000 Tons of COAL and CANNEL delivered at the Middleton Railway Station.

Further Particulars may be obtained from Mr. E. E. J. Anderson, M.Inst.M.E., Gas Engineer.

Tenders, addressed to the Chairman of the Gas, &c., Committee, and endorsed "Tender for Coal and Cannel," to be delivered at my Office not later than the 10th of June, 1903.

The Corporation do not bind themselves to accept the lowest or any Tender.

FREDERICK ENTWISTLE,
Town Clerk.

Town Hall, Middleton,
May 26, 1903.

SEVENOAKS GAS COMPANY.

TENDERS FOR GAS COAL.

THE Directors of the Sevenoaks Gas Company invite TENDERS for 7000 Tons of GAS COAL (Durham or Yorkshire preferred), to be delivered at the Company's Siding, Bat and Ball Station, S.E. & C. Railway, Sevenoaks, Kent, for Twelve Months ending June 30, 1904.

Tenders must be sent in not later than Tuesday, June 9 next, addressed to the Chairman, Wm. Henry Cronk, Esq., 88, High Street, Sevenoaks.

Further Particulars may be obtained from the undersigned.

HENRY HOW,
Secretary.

Gas Office, Sevenoaks,
June 1, 1903.

MALTON GAS COMPANY.

TENDERS FOR GAS COAL.

THE Directors of the Malton Gas Com- pany are prepared to receive TENDERS for the supply of 4000 Tons of GAS COALS, COBBLES, or NUTS, to be delivered in such monthly quantities as may be required by the Company.

Tenders to state the Price of the Coal delivered at Malton Station (N.E. Railway) free of all charges.

The Directors do not bind themselves to accept the lowest or any Tender.

Further Particulars may be obtained on application to the undersigned.

Sealed Tenders, endorsed "Tender for Coal," specifying the description and quality of Coal, to be sent on or before the 13th of June next.

HENRY TOBEY,
Engineer and Secretary.

Malton, May 27, 1903.

ROTHWELL URBAN DISTRICT COUNCIL.

(GAS DEPARTMENT.)

THE above Council invite Tenders for the supply of about 1200 Tons of best screened GAS COAL, to be delivered free at the Desborough Station (Midland Railway) in such quantities and at such periods as may be ordered from time to time between the 1st of July next, and the 30th of June, 1904.

No special Form of Tender is provided.

The Council do not bind themselves to accept the lowest or any Tender, and reserve the right to accept the whole or any portion of the quantity offered.

Tenders, endorsed "Tender for Gas Coal," to be delivered to me on or before the 15th day of June, 1903.

By order,
FRED. MAYALL,
Deputy-Clerk.

Market House, Rothwell,
Kettering, June 1, 1903.

NEW MILLS URBAN DISTRICT COUNCIL.

TENDERS FOR GAS COAL, &c.

THE New Mills Urban District Council invite TENDERS for the supply of 2000 Tons of best GAS COAL, and 200 Tons of CANNEL for the Year ending the 30th of June, 1904.

Forms of Tender and full Particulars may be had on application to the Gas Manager.

TENDERS are also invited for the purchase of the surplus TAR and LIQUOR for One Year ending June 30, 1904.

Tenders, properly endorsed, to be sent to me, the undersigned, not later than June 15, 1903.

The Council do not bind themselves to accept the lowest or any Tender.

J. POLLITT,
Clerk.

Town Hall, New Mills,
May 28, 1903.

BOROUGH OF HEYWOOD.

THE Gas Committee invite Tenders for the supply of 12,500 Tons of COAL and 500 tons of CANNEL.

Specification and Form of Tender may be obtained upon application to Mr. W. Whatmough, Gas Manager.

Sealed Tenders, marked "Coal," to be sent to me not later than Tuesday, June 16, 1903.

By order,
GEO. G. BOUCHIER,
Town Clerk.

Municipal Buildings, Heywood,
May 20, 1903.

THE LEAMINGTON PRIORS GAS COMPANY.

TENDERS FOR GAS COAL.

THE Directors of the Leamington Priors Gas Company are prepared to receive TENDERS for the supply of the GAS COAL required by them during Twelve Months from the 1st of July next.

Particulars and Forms of Quotation may be obtained from the undersigned.

Tenders must be sent in on or before Tuesday, the 23rd of June, 1903.

THOMAS BERRIDGE,
Engineer and Secretary.

LEIGH-ON-SEA URBAN DISTRICT COUNCIL.

THE Leigh-on-Sea Urban District Council invite TENDERS for the supply of 800 Tons of good GAS COAL, to be delivered at the Gas-Works Wharf, Leigh-on-Sea, as required, in quantities of not more than 80 Tons.

Sealed Tenders, endorsed "Tender for Coal," must be received by me not later than Thursday, the 11th day of June next.

The Council do not bind themselves to accept the lowest or any Tender.

ALFRED J. ARTHY,
Clerk to the Council.

Council Offices, Leigh-on-Sea,
May 27, 1903.

COUNTY BOROUGH OF BURY.

TENDERS FOR GAS COALS.

THE Gas Committee are prepared to receive TENDERS for the supply of:—

40,000 Tons of GAS COAL
500 Tons of BURGY } More or less
300 Tons of HOUSE COAL }

Forms of Tender and Conditions of Contract may be obtained on application to Mr. H. Simmonds, Engineer and Manager, Gas-Works, Bury.

Tenders, endorsed "Gas Coal," to be sent to the undersigned not later than Saturday, the 13th day of June, 1903.

JOHN HASLAM,
Town Clerk.

Municipal Offices,
Bank Street, Bury.
May 26, 1903.

CORPORATION OF LANCASTER.

(GAS DEPARTMENT.)

TENDERS FOR GAS COAL.

THE Gas Committee are prepared to receive TENDERS for the supply of screened GAS COAL, to be delivered on the Gas-Works Siding, Lancaster, in such quantities and at such times as may be required, during a period of Twelve Months, commencing delivery July 1 next.

Sealed Tenders, endorsed "Gas Coal," giving full Particulars of the Coal offered, must be delivered to T. C. Hughes, Esq., Town Clerk, Lancaster, on or before Friday, June 12.

Any further Information and Forms of Tender may be obtained on application to the undersigned.

C. ARMITAGE,
Manager.

Gas-Works, Lancaster.

HOLBEACH GAS AND COKE COMPANY, LIMITED.

THE Directors of the above Company are prepared to receive TENDERS for the supply of 700 Tons of large screened GAS COAL and large NUTS (Railway weight), to be delivered at the Holbeach Railway Station at such times and in such quantities as the Company shall require.

Terms of payment, 80 per cent. on each delivery, and the balance on completion of the Contract.

Tenders, marked "Tender for Gas Coal," stating names of Coal and Analysis, to be sent to me not later than Two p.m. on Thursday, the 11th of June next.

No Form of Tender supplied.

The Directors do not bind themselves to accept the lowest or any Tender.

By order,
THOS. C. WILLDERS,
Secretary.

Holbeach, May 25, 1903.

BOROUGH OF NEWBURY.

(GAS DEPARTMENT.)

THE Gas Committee of the Newbury Corporation invite TENDERS for the supply of 4800 Tons of best GAS COAL or NUTS during the period of Twelve Months between July 1 next and the 30th of June, 1904, to be delivered free to Newbury Station on the Great-Western Railway, in such quantities as may be agreed.

Tenders to be endorsed "Tender for Coal," and addressed to the Chairman of the Gas Committee, Gas-Works, Newbury, and delivered not later than the 12th of June next.

The Committee do not bind themselves to accept the lowest or any Tender.

Particulars and Form of Tender from the undersigned.

WM. R. DAVEY,
Manager.

Gas-Works, Newbury,
May 29, 1903.

THE Urban District Council of Hindley are prepared to receive TENDERS for the supply of GAS COAL, CANNEL, ENGINE SLACK, and LIME, required at their Gas-Works during the ensuing Twelve Months.

Full Particulars, with Form of Tender, can be obtained on application to Mr. H. O. Timmins, Gas and Water Manager.

Sealed Tenders, endorsed "Tender for Gas Coal, &c.," to be lodged with the undersigned not later than Monday, June 15, 1903.

By order,
THOMAS ROBEY,
Clerk to the Council.

Offices: Cross Street,
Hindley, May 28, 1903.

PORTLAND URBAN DISTRICT COUNCIL.
(GAS DEPARTMENT.)

TENDERS FOR COAL.

THE Gas Committee of the above Council are prepared to receive TENDERS for the supply of from 3500 to 4000 Tons of GAS COAL required at their Works for the Year ending June 30, 1904.

Tenders to be sent, addressed to the Chairman at the Gas-Works, Portland, endorsed "Tender for Coal," not later than June 18, 1903.

Form of Tender and general Conditions of Contract will be supplied on application to the undersigned.

JNO. O. WHITAKER,
Engineer and Manager.

Gas-Works, Portland.
May 20, 1903.

TO COAL CONTRACTORS AND OTHERS.

THE Sedgley Urban District Council invite TENDERS for supplying 750 to 1000 Tons of GAS COAL, the deliveries to be made at the Shut End Siding, at such times and in such quantities as may be directed.

It is desirable that a Statement of Analysis of the quality of a sample of the Coal to be supplied be sent with the Tender.

Sealed Tenders, marked "Coal," must reach me on or before the 4th of June, 1903.

The Council do not bind themselves to accept the lowest or any Tender.

By order,
JOSEPH SMITH,
Clerk to the Council.

Offices: High Holborn,
Sedgley, May 15, 1903.

THE SHREWSBURY GASLIGHT COMPANY.

TENDERS FOR COAL.

THE Directors of the Shrewsbury Gaslight Company invite TENDERS for the supply of about 16,000 Tons of Screened GAS COAL, to be delivered free at the Great Western or London and North-Western Goods Yard, Shrewsbury, during the Year commencing July 1, 1903, and ending June 30, 1904.

The Directors reserve to themselves the right to divide the quantity into two or more Contracts, and do not bind themselves to accept the lowest or any Tender.

Tenders must be made on Forms (containing further Particulars) which may be obtained on application at the Company's Works, or by post, and must be sent to the undersigned, on or before the 13th day of June, 1903.

By order,
WM. BELTON, Assoc.M.Inst.C.E.
Secretary and Manager.

Gas-Works, Shrewsbury,
May 13, 1903.

HEBDEN BRIDGE AND MYTHOLMROYD GAS BOARD.

THE above Board are prepared to receive TENDERS for 6000 Tons of GAS COAL and 1000 Tons of CANNEL, to be delivered free into the Gas Board's Sidings at Hebden Bridge, in quantities as the Board may require during the next Twelve Months.

Forms of Tender and any further Particulars may be had on application to E. J. Wellens, Engineer and Manager.

Tenders, endorsed, and addressed to James Simpson, Esq., Chairman, must be delivered by noon on Thursday, June 6, 1903.

The Committee do not bind themselves to accept the lowest or any Tender; and reserve to themselves the right to divide the quantity as required.

By order of the Board,
R. CRABTREE,
Clerk.

May 18, 1903.

HARTLEPOOL GAS AND WATER COMPANY.

IMPORTANT SALE OF GAS AND WATER STOCK.

TO BE SOLD by Auction at the Company's Offices, Middleton Road, West Hartlepool, on Thursday, the 11th of June, 1903, at 2.30 p.m. precisely,

MR. J. W. CROSBY, AUCTIONEER,

£5000 OF HARTLEPOOL GAS AND WATER COMPANY'S FIVE PER CENTUM MAXIMUM ORDINARY STOCK,

as follows—namely, £5000 (Nominal) of the New Stock (Maximum Dividend Five per cent.) authorized to be created and issued under the Powers contained in the Company's Act, 1900.

The above Stock will be entitled to Dividend from the 27th day of June next, if then fully paid up, and will be registered in the name of the Purchaser without charge.

A Deposit of 10 per cent. will be required to be paid at the time of Sale and the remainder on or before the said 27th day of June.

The Stock will be offered in Lots of £100 each.

By order of the Directors,
W. SCOTT,
Secretary.

Hartlepool Gas and Water Company's Office,
West Hartlepool, May 14, 1903.

ISSUES BY AUCTION OF GAS AND WATER STOCKS AND SHARES.

MR. ALFRED RICHARDS begs to notify that his ISSUES by AUCTION under PARLIAMENTARY POWERS of STOCKS and SHARES in LONDON, SUBURBAN, and PROVINCIAL GAS and WATER COMPANIES take place PERIODICALLY at the Mart, TOKENHOUSE YARD, E.C.

Terms for Issuing such Capital, and also for including Gas and Water Stocks and Shares belonging to Private Owners in these Periodical Sales, can be obtained on application at Mr. ALFRED RICHARDS' OFFICES, 18, FINSBURY CIRCUS, E.C.

By order of the Directors of the

HASTINGS AND ST. LEONARDS GAS COMPANY.

NEW ISSUE OF £10,000 NEW ADDITIONAL 5 PER CENT. ORDINARY STOCK.

MR. ALFRED RICHARDS will Sell the ABOVE BY AUCTION, at the Mart, E.C., on Tuesday, June 9, at Two o'clock, in Lots.

Particulars of the AUCTIONEER, 18, FINSBURY CIRCUS, E.C.

GAS AND WATER STOCKS AND SHARES.

MR. ALFRED RICHARDS will Sell by AUCTION, at the Mart, Tokenhouse Yard, E.C., on Tuesday, June 9, at Two o'clock, in Lots, the following STOCKS and SHARES—

BRIGHTON AND HOVE GAS COMPANY,
£1120 ORIGINAL ORDINARY STOCK.

BARNET DISTRICT GAS AND WATER COMPANY,
£500 "C" STOCK, £100 "D" CAPITAL WATER STOCK, and ALLOTMENTS OF "D" CAPITAL WATER STOCK.

BOURNEMOUTH GAS AND WATER COMPANY,
40 £10 "B" SHARES.

GAS-METER COMPANY, LIMITED,
40 £10 ORDINARY SHARES.

Particulars may be obtained of the AUCTIONEER, 18, FINSBURY CIRCUS, E.C.

By order of the Directors of the

WEST HAM GAS COMPANY.

NEW ISSUE OF £15,000 CONSOLIDATED ORDINARY STOCK.

MR. ALFRED RICHARDS will Sell the ABOVE BY AUCTION, at the Mart, E.C., on Tuesday, June 16, at Two o'clock, in Lots.

Particulars of the AUCTIONEER, 18, FINSBURY CIRCUS, E.C.

By order of the Directors of the

TONBRIDGE GAS COMPANY.

NEW ISSUE OF £5000 FOUR PER CENT. PERPETUAL DEBENTURE STOCK.

MR. ALFRED RICHARDS will Sell the ABOVE BY AUCTION, at the Mart, E.C., on Tuesday, June 16, at Two o'clock, in Lots.

Particulars of the AUCTIONEER, 18, FINSBURY CIRCUS, E.C.

By order of the Directors of the

SOUTH ESSEX WATER-WORKS COMPANY.

NEW ISSUE OF £5000 ORDINARY STOCK.

MR. ALFRED RICHARDS will Sell the ABOVE BY AUCTION, at the Mart, E.C., on Tuesday, June 16, at Two o'clock, in Lots.

Particulars of the AUCTIONEER, 18, FINSBURY CIRCUS, E.C.

GAS STOCKS AND SHARES.

MR. ALFRED RICHARDS will Sell by AUCTION, at the MART, E.C., on TUESDAY, JUNE 16, at Two o'clock in Lots, Stocks and Shares in the following:—

CROYDON COMMERCIAL GAS AND COKE COMPANY;

PORTSEA ISLAND GASLIGHT COMPANY;

and the

MALTA AND MEDITERRANEAN GAS COMPANY, LIMITED.

Particulars of the AUCTIONEER, 18, FINSBURY CIRCUS, E.C.

By order of Trustee, and another.

COLNEY HATCH GAS COMPANY,
100 £10 ORIGINAL SHARES, Dividend 10 per Cent.

HORLEY DISTRICT GAS COMPANY,
£225 ORIGINAL STOCK, ranking for a Maximum Dividend of 10 per Cent. Dividend for 1902, 4¾ per Cent.

GORING AND STREATLEY DISTRICT GAS AND WATER COMPANY, LIMITED,
60 £5 ORIGINAL GAS CAPITAL and 30 £5 ORIGINAL WATER CAPITAL SHARES; Dividends for 1901 and 1902, on each Class of Shares, 5 per Cent. per annum.

ALDEBURGH GASLIGHT COMPANY, LIMITED,
10 £10 SHARES; Dividend 10 per Cent., Free of Income-Tax.

MESSRS. EDWIN FOX & BOUSFIELD will include the above in their next STOCK and SHARE AUCTION, at the Mart, E.C., on Wednesday, June 17, at 2.30 o'clock, in Lots.

Particulars at the AUCTIONEERS' OFFICE, 99, Gresham Street, BANK, E.C.

BOROUGH OF DONCASTER.

TENDERS FOR COAL.

THE Gas Committee of the Borough of Doncaster are prepared to receive TENDERS for the supply of 21,000 Tons of best screened GAS COAL during a period commencing July 1, 1903, and terminating June 30, 1904.

Particulars and Forms may be obtained on application to the undersigned.

Tenders should be sent, under seal, to the Chairman, endorsed "Tender for Coal," not later than Ten a.m. on Friday, June 12.

By order of the Gas Committee, who do not bind themselves to accept the lowest or any Tender.

ROBT. WATSON,
Engineer and Manager.

Gas-Works, Doncaster.
May 20, 1903.

THE GASLIGHT AND COKE COMPANY.

NOTICE is Hereby Given, that the TRANSFER BOOKS of this Company, so far as they relate to DEBENTURE STOCK and BONDS, WILL BE CLOSED at Four o'clock p.m. on Wednesday, the 10th prox., for the Half Year ending on the 30th prox., and WILL BE RE-OPENED on the morning of Thursday, the 11th prox.

The Interest for the Half Year will be payable on the 1st of July next to the Proprietors registered on the closing of the Books.

By order,
JOHN WILLIAM FIELD,
Secretary and General Manager.

Chief Office: Horseferry Road,
Westminster, S.W., May 28, 1903.

CHELSEA WATER-WORKS COMPANY.

NOTICE is Hereby Given, that the Half-YEARLY GENERAL MEETING of the Governor and Company of Chelsea Water-Works will be held at their Office, Commercial Road, Pimlico, in the County of London, on Thursday, the 25th day of June prox., at One o'clock in the afternoon precisely, for the General Business of the Company.

The REGISTER OF TRANSFERS WILL BE CLOSED between the 13th day of June prox. and the 25th day of June prox., both days inclusive.

By order,
G. H. GILL,
Secretary.

Office: 41, Commercial Road,
Pimlico, May 30, 1903.

LAMBETH WATER-WORKS COMPANY.

NOTICE is Hereby Given, that it is the intention of the Company to SELL BY TENDER £100,000 Three per Cent. DEBENTURE STOCK, redeemable at par at the option of the Company on six months' notice at any time after the expiration of 25 years from the date of issue.

Particulars, Conditions of Sale, and Forms of Tender may be obtained at the Company's Office, Brixton Hill, S.W.

Sealed Tenders are to be delivered at the said Office not later than Twelve o'clock (noon) on Monday, the 22nd of June, 1903.

H. WILKINS,
Secretary.

Brixton Hill, S.W.
April 21, 1903.

FELIXSTOWE GASLIGHT COMPANY, LIMITED.

ISSUE of £3100 4 PER CENT. DEBENTURE STOCK.

THE Directors of the Felixstowe Gaslight Company, Limited, invite Applications for 31 FIRST MORTGAGE DEBENTURES of £100 each, bearing Interest at Four per Cent. per annum.

Applications should be accompanied by a deposit of 5 per cent. on the amount applied for, and delivered to the Secretary on or before Saturday, June 6, 1903. The balance of the purchase-money will be payable on notice of allotment.

Further Particulars on application to the Secretary.

F. PATERNOSTER,
Secretary.

Hamilton Road, Felixstowe.

Now Ready, Price 10s. 6d., Green Cloth, Gilt Lettered.

VOL. LXXXI.

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By PETE CURRAN

(Organizer of the Gas Workers and General Labourers Union, late Trade Union Delegate to the United States, Chairman of the Federation of Trade Unions, Member of the Executive Council of the Labour Representation Committee),

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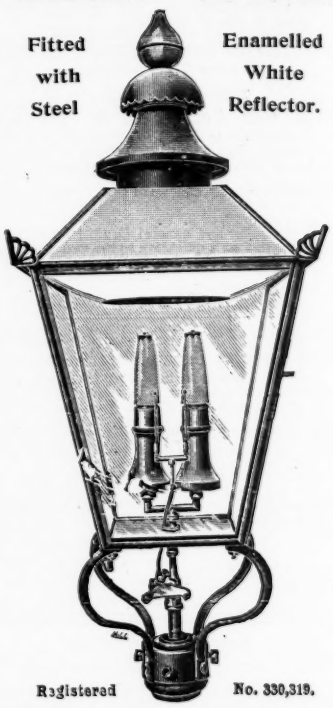

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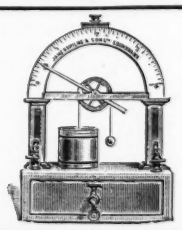

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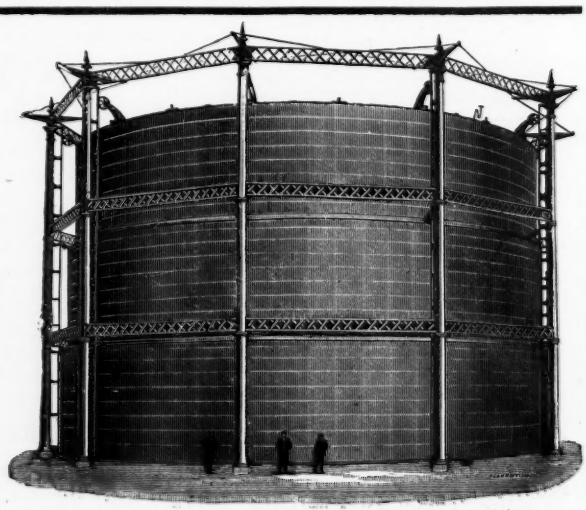

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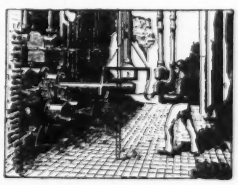
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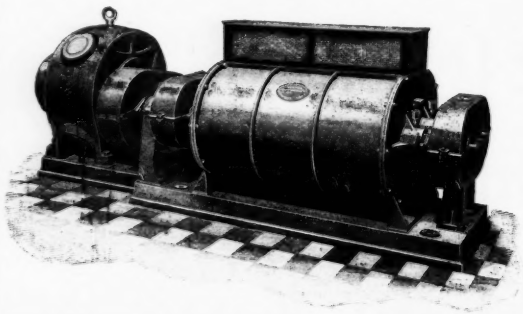

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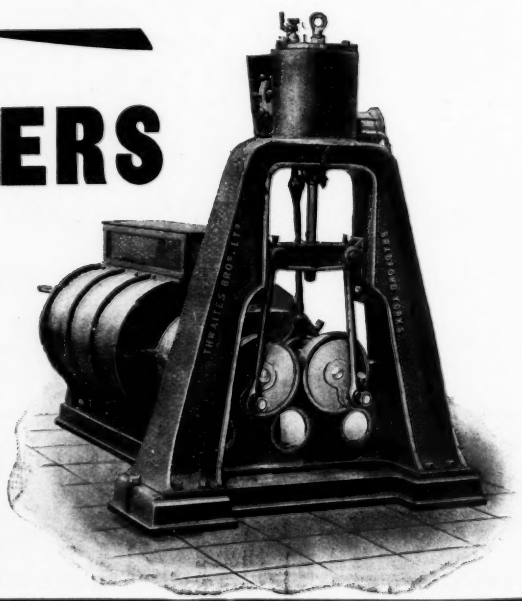

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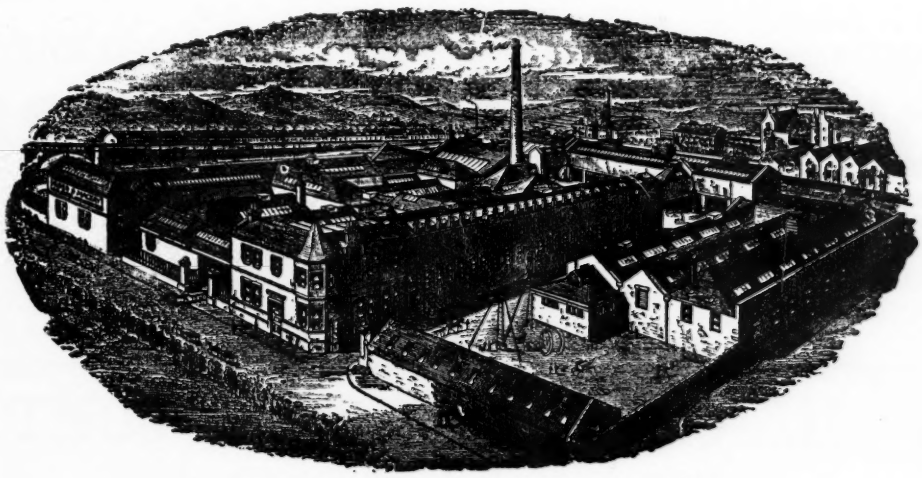

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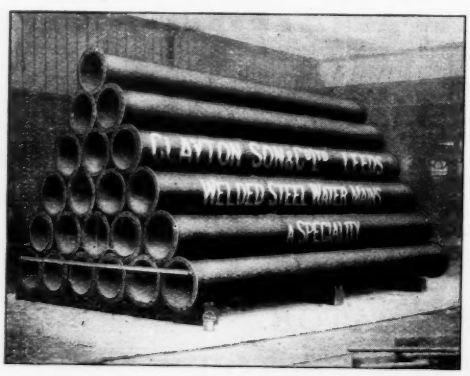

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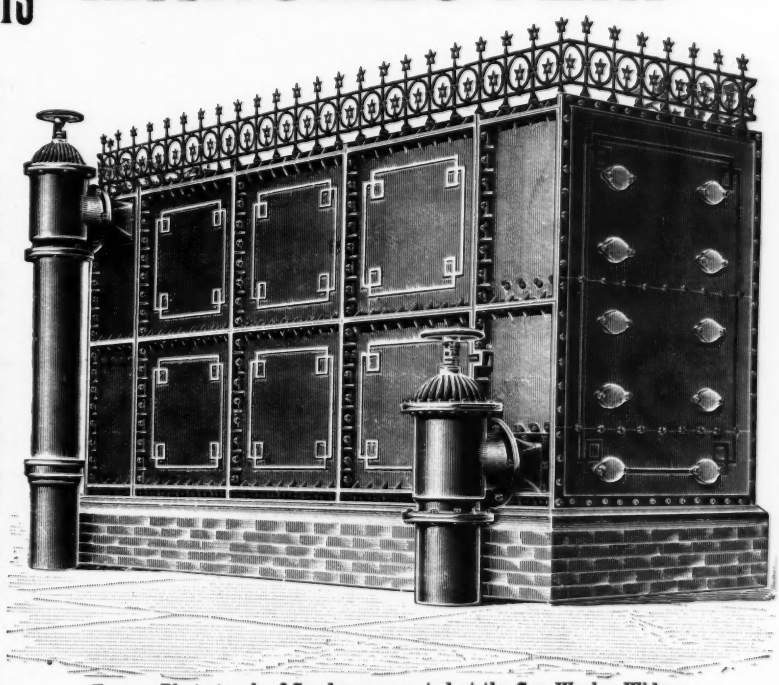
R. & J. DEMPSTER, LTD., recommend this Condenser to be used as a Finishing Condenser, after the gas has already passed through the ordinary Annular or Air Condensers.

Condensers of this type equal to 10,500,000 cubic feet per 24 hours already erected and at work.



From a Photograph of Condenser erected at the Gas-Works, Widnes.
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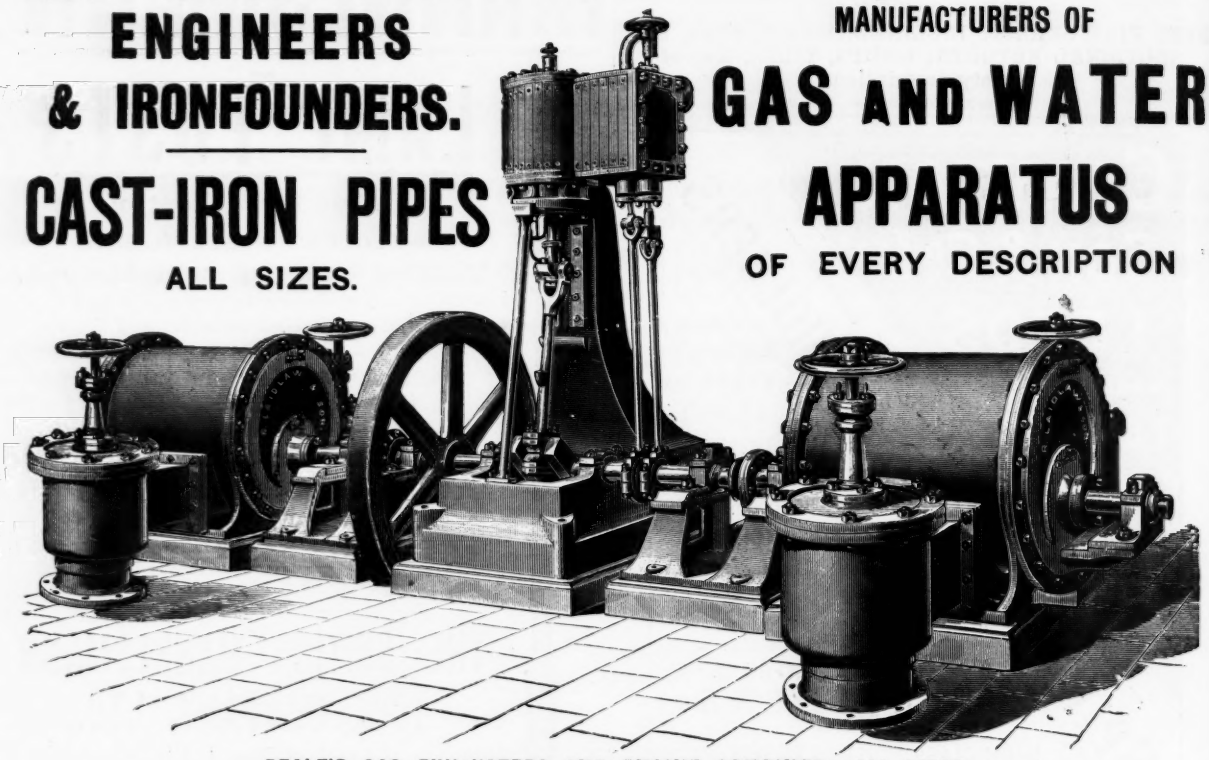

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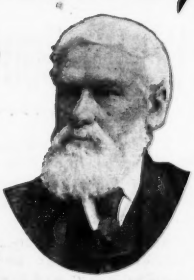

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